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An Address on
THE SCIENTIFIC METHOD IN MEDICINE*

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PROGRESS in science has revolutionized the conditions under which we live in modern times. The practical application of discoveries made in science has had its influence on the activities of our daily life, so that, at every turn, we find ourselves reaping the benefit of "the growth of truth" in the contribution of scientific investigators to the sum of human knowledge. In no realm of science is this more evident than in medicine.

Scientific methods were early introduced into the practice of medicine. An essential part of all investigations in science is accuracy of observation, which was the foundation of Greek medicine four centuries before Christ. Through the influence of Aristotle in biological science and the work of Hippocrates, the "father of medicine" we have introduced thus early into practice this essential element of the scientific method in its application to medicine. No one can read the works of Hippocrates without being impressed with the remarkable extent of his observations and of the persistent attempt he made, in a vast field, to elucidate the laws of nature both in health and disease. Herophilus, a Greek philosopher and physician, practised at Alexandria at the beginning of the third century B.C. Anatomy in his day was made the basis of medical education. Certain terms which are still in current use in anatomical nomenclature were introduced by him; they indicate the wide scope of his investigations. The "torcula Herophili" (wine press of Herophilus), one of the blood sinuses of the brain; the depression in the fourth ventricle of the brain called by him the calamus scriptorius because it resembled a writing pen, and the duodenum are terms translated from the Greek and originally described and named by him. The accuracy of method introduced by Herophilus doubtless had a great influence on the subsequent progress of medical science; it laid the foundation which was essential for further progress. It has been said "without Herophilus we should have had no Harvey and the rise of physiology might have been delayed for centuries." (Singer). A remarkable passage occurs in the writings of Herophilus which indicates the value placed by him on health. He says "that science and art have equally nothing to show, that strength is incapable of effort, wealth useless, and eloquence powerless if health be wanting." (Singer).

Galen (130 A.D.) was one of the greatest anatomists of antiquity. In knowledge of the bones and muscles he far exceeded all his predecessors. He distinguished between cerebral and spinal nerves, the former he considers sensory, the latter motor in function. He disproved the idea formerly conceived that the arteries contained air and he possessed an intimate knowledge of the heart and its valves. His observations were, however, chiefly made from the lower animals and he probably never dissected a human subject. With his death in 193 A.D. was reckoned the downfall of anatomy in ancient times.

The influence of the teaching of Galen was

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paramount for many centuries. For example in the fourteenth century when the School of Medicine of Bologna became celebrated, Mondino who has been described as the "father of modern anatomy" (because he taught solely from the human cadaver) was unable to throw aside the powerful influence of the teaching of Galen. It is interesting to note the views which were held in those days. There was an attempt to localize the function of different portions of the brain; the first part of the "anterior ventricle" was considered the seat of common sensation, in the second part, fancy was bred. In the "middle ventricle" thought, reason and judgment, while in the "posterior ventricle" memory dwelt. There were channels between the ventricles which permitted the passage of "spirits" from one to the other. Blood was believed to be formed in the liver and passed from thence to the heart where "spirit" was produced which formed the link between body and soul. The blood ebbed and flowed in the veins and arteries. The lungs were supposed to receive "smoky vapours from the heart, they were also supposed to expel superfluous matters from the brain through the naso-pharynx, and so an ordinary cold was supposed to be a "purgamentum cerebri." These teachings of course seem crude and grotesque in view of our present knowledge and yet who knows how fragmentary and inadequate our knowledge of the function of the human body may appear to our successors after a few more centuries have passed.

Throughout the history of medicine we may note great "milestones" which not only record a continuous line of progress but often mark a specific junction on the road where a divergence occurs; some bold traveller leaves the beaten path and strikes out into the wilderness of the unknown and there finds rich treasure which revolutionizes the entire conception of human life and activity. Many travellers will persist in keeping to the old path for a time, but, if the revolutionist has discovered truth the sceptic and the cynic will be forced to abandon the old road, often by painful and devious by-ways, and will eventually take the new path which leads to the haven of broadened outlook with richer promise of achievement.

The revival of the study of human anatomy in the sixteenth century may serve as an illustration. The greatest obstacle to the acquisition of accurate anatomical knowledge was the difficulty in obtaining human subjects for dissection. A difficulty which was destined to continue for centuries after the period we are considering. It led in the early part of the eighteenth century to the gruesome practice of stealing bodies from the church yard, a procedure which was encouraged and paid for by the medical schools of the day. Sir Astley Cooper was known by the unenviable title of "The king of resurrectionists." It was said that complete immunity from the law was secured for him by the Lord Mayor of London who, with the British Government understood that this crying evil must be permitted for a time else the country could have no medical schools. The poet Hood satirized the prevalent customs of the time when he makes the ghost of a lately deceased lady address her former husband thus:—

"As for my feet, the little feet
You used to call so pretty
There's one, I know, in Bedford Row,
The t'other's in the City."

The advent of Vesalius in the sixteenth century marks an epoch of essential importance in the progress of medical science. He revolutionized the teaching of anatomy. Hitherto the authority of Galen was unchallenged; had remained unchallenged for fourteen centuries in spite of the fact that his writings contained many erroneous conceptions. His writings were accepted with something akin to the sacred respect which is reserved for holy writ. Far be it from me to undervalue the importance of cultivating respect for authority but there is a slavish respect for authority which is exceedingly harmful. The modern scientist is far removed from the credulous individual of the middle ages who accepted the views of Galen without sufficient proof of their accuracy. Vesalius, however, boldly attacked the doctrines of Galen, and suffered persecution such as is usually experienced, in modern as in ancient times, by those who express views of a revolutionary character. He studied anatomy in the human subject, while swine had hitherto been used for the purpose because of the difficulty of procuring human material. The internal anatomy of swine was supposed to be similar to that of man, a belief which is popular even at the present day. Vesalius was born

in Brussels in 1514. At the age of fourteen he began the study of anatomy under Sylvius in Paris. Subsequently he went to Italy and at the age of twenty-two was called to demonstrate publicly in the University of Padua and subsequently taught in Bologna and Pisa. At the age of twenty-eight he published an extensive treatise on anatomy. The illustrations of this work were drawn by eminent artists, some of them being ascribed to Titian. His description of human anatomy was based on accurate observation of the structure of the human body. Hitherto no one had the courage to question the teaching of Galen. There was also much superstition at the time. Mondino for example, a predecessor of Vesalius at Bologna would not venture to open the skull because, we are told, "he wished to escape burdening his soul with mortal sin."

The bold stand of Vesalius brought down upon him a host of adverse critics, who were most virulent in their attacks upon the man who ventured to question the teachings of the greatest authority of the age. One of his most bitter opponents was his old teacher, Sylvius. But Sylvius got worsted in the controversy and was at last coerced into making certain admissions. He covered his retreat by insisting that the structure of the human body had changed and not for the better; it was deterioration he saw and not improvement although the standard of excellence chosen by Sylvius was Galen's description of the ape. Vesalius was returning from a pilgrimage to Jerusalem when his ship was wrecked on the island of Zante. There he died at the age of fifty. His career was short but brilliant, he stood out boldly as the enunciator of revolutionary doctrines and braved the criticism of all his contemporaries. He succeeded nobly. His efforts have secured for him the title of "founder of human anatomy."

I have given this short historical sketch to show that up to the middle of the sixteenth century the scientific method, as applied in the development of medical progress, consisted of observing and interpreting the phenomena of life in health and disease. There was marked progress as long as the observation was accurate and the interpretation sound. Accuracy of observation was the sole avenue of approach to scientific research. In the early part of the seventeenth century a new impetus was given to the investigations and development of medicine when William Harvey introduced the experimental method. So much stress is placed on this fact in the life and work of Harvey by his biographers that, many consider his introduction of experiment, for the elucidation of problems in scientific medicine, overshadows in importance the discovery of the circulation of the blood, which latter has made his name immortal. Harvey was born at Folkestone in 1578. He matriculated at Cambridge in 1611 and there lived and worked at Caius College. Subsequently he went to Italy and there studied with Fabricius who, with Fallopius, was a pupil and successor of Vesalius. The anatomists of the time had cast off the yoke of Galen. Harvey recognizing the significant bearing of the "new anatomy," began a series of experimental investigations which eventually disproved the theories of function enunciated by Aristotle and Galen. Thus as an infallible authority both in anatomy and physiology after a lapse of fourteen centuries Galen was dethroned.

Harvey approached the problem which he strove to solve in a manner which excites our admiration, illustrating as it does a method at once systematic, thorough and effective. He studied the work of his predecessors, he pointed out many inconsistencies and defects in the theories of Galen whose views he treated "with great respect but with unflinching criticism." Vesalius had already established anatomy on a firm basis of accurate observation and description. Sylvius had demonstrated valves in the veins; Servetus conceived the idea that the blood which passed in the pulmonary artery was transferred in the lungs to the pulmonary veins. Harvey made his own observations, enunciating the doctrine that "wise men must learn anatomy, not from the decrees of philosophers, but from the fabric of nature herself." He made many dissections, not only of the human body but of the lower animals, so that be obtained a greater knowledge of comparative anatomy than any of his contemporaries and in fact than any of his successors down to the time of John Hunter two centuries later.

He now began to study the movements of the heart and of the blood in living animals. Charles I. became interested in Harvey's investigations, and put the royal deer parks at Wind-

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sor and Hampton Court at his disposal. He also made a minute study of these phenomena in dogs, pigs, serpents, frogs and fishes as well as in the developing chick. Among invertebrates he studied slugs, oysters, lobsters and insects, using a simple lens for the purpose. He showed that the arrangement of the vessels in the fœtus supported his theory of the circulation of the blood. The valves in the veins favoured the return of blood to the heart. He studied the circulation in man both in health and disease. He demonstrated the effect of obstructing the circulation by a tight ligature on the arm of a man or by the application of forceps in certain of the lower animals. By these means, by the experimental method, and in conformity with the facts deduced from his anatomical studies, Harvey established scientific proof of the circulation of the blood. Harvey's discovery was perhaps all the more remarkable because he had no means of demonstrating the minute channels through which in the tissues the blood passes from the terminal ramification of the arteries to the radicals of the veins. This missing link in the chain of evidence was supplied by Malpighi who in 1661 with the aid of the newly invented microscope discovered the capillary circulation in the lung of a frog.

In April, 1616, as Lumleian lecturer in the "Physicians' College" Harvey laid the facts of his discovery before his fellow practitioners. The views expressed were revolutionary in character; they completely upset pre-existing theories regarding vital phenomena in man. The lectures were delivered in Latin and were illustrated by many demonstrations. Convincing proof of the correctness of his views was produced and yet, many men of his day, blinded and prejudiced as they were by the thraldom of tradition, refused to abandon the doctrines which had held sway for fourteen centuries. I doubt if our minds at the present day are any more receptive when orthodox doctrine is assailed. As Osler puts it the "iron yoke of conformity is on our necks; and, in our minds, as in our bodies, the force of habit becomes irresistible."

Twelve years elapsed before the new doctrine was published and made accessible. The Fellows of the College always bore an affectionate esteem for Harvey. He in turn exhibited a spirit of remarkable forbearance and patience toward those who opposed his views. With untiring pertinacity and courtesy he argued with his critics and in many instances won them over to the faith. One notes with feelings somewhat akin to chagrin that Dr. James Primrose, of Scottish descent, "brought up in the strongest sect of the Galenists," opposed Harvey's views in 1632 and remained unconvinced twelve years later when he had a controversy with Regius. The English translation from the French of the work of Riolan, the anatomist, published in 1671 maintained the old traditional views. On the other hand Harvey had many ardent supporters among whom was one of his contemporaries, Sir Thomas Browne, the author of the "Religio Medici" who declared in his enthusiasm and in his quaint style, that "he preferred the circulation of the blood to the discovery of America."

Such then is the history of the momentous contribution of Harvey in discovering the circulation of the blood and in introducing the experimental method of scientific research in medicine.

Harvey was for a time physician to St. Bartholomew's Hospital, an institution which in 1923 celebrated its 800th anniversary. He was a great benefactor of the Royal College of Physicians. He had erected for them "a noble building of Roman architecture (rustic work with Corinthian pilasters), comprising a great parlour or conversation room below and a library above." He furnished the library with books and the museum with specimens. Finally he left his estate in Kent to his beloved college and bequeathed a sufficient amount of money to pay the salary of the college librarian and an endowment to provide for an annual oration which is still given on the anniversary of his death. In his deed of gift Harvey exhorted the fellows of the college "to search out and study the secrets of nature by way of experiment, and also for the honour of the profession to continue mutual love and affection among themselves.

A century after Harvey's death John Hunter (1728-1793) a Scotchman by birth was adding lustre to the cause of scientific progress. He was an indefatigable worker and made many dissections both of human subjects and of a great variety of animals. He is said to have "anatomized" over 500 different species of animals. His enthusiasm in securing anatomical material may be illustrated by the deliberate manner in which he planned to get posses-

sion of the skeleton of an individual known as the "Irish Giant." This giant, O'Brien by name, learned during his life time that Hunter's eye was upon him, and he therefore took precautionary measures, and ordered that, on his death, his body should be carefully guarded by relays of men until a leaden casket could be procured, in which the body was to be placed, and then carried out to sea and sunk. Hunter, however, was not to be baffled. On the giant's death Hunter bought the watchers off. At first they agreed to a dereliction of duty for fifty pounds, but getting that so easily they demanded fifty more, and only ceased to extort when Hunter refused to budge a penny beyond four hundred pounds! The skeleton of this giant may be seen to-day in the Hunterian Museum of the Royal College of Surgeons. Hunter was a physiologist as well as an anatomist and employed the experimental method in his research work. Like Harvey, the reigning sovereign granted him the privilege of experimenting on the deer in the royal parks. In 1785 he tied the external carotid artery which supplies the antler and the soft vascular covering called the velvet. He found that the pulsations in the velvet ceased and the antler which received its blood supply therefrom grew cold to the touch. He debated whether the antler would be shed or would be retained longer than usual. To his surprise he found, a week or two later, the antler had regained its warmth and was still increasing in size. On killing the buck the tied external carotid artery was found to be obliterated but numerous small vessels had become enlarged under the new conditions and by their anastomosis had carried ample blood supply to the growing parts. Thus became enunciated the principle of anastomotic circulation induced under the "stimulus of necessity" to use the experimenter's own phrase. This discovery was destined to have a far reaching effect in the practice of surgery.

Hunter also investigated the conditions which presented themselves in disease and his knowledge of pathology was far in advance of his time. At forty years of age he was appointed surgeon to St. George's Hospital. He raised surgery to the dignity of a true science. He had by his own efforts demonstrated the facts of anatomy, he had elucidated many difficult problems which present themselves both in health and disease and in bringing this knowledge to bear upon treatment, he completely revolutionized surgical practice. He was progressive in his work; he recognized no authority but at the same time shrank from posing as an authority himself. To Astley Cooper, who asked with surprise whether he had not the year before stated an opinion on some point directly at variance with one he had just put forth, he replied, "very likely I did; I hope I grow wiser every year." Occasionally he would say to one of his pupils "you had better not write down that observation, for very likely I shall think differently next year."

He was an extraordinary collector and built up an extensive museum. The bulk of the preparations and dissections were made by his own hands. Upon this collection he spent some £70,000. In fact all his available funds went in that direction, so that at his death he left barely enough to pay his debts. The museum was purchased some six years after his death by the British Government who paid £15,000 for it, and handed it over to the Royal College of Surgeons as custodians. The Hunterian museum is well known to our profession the world over. Endowment was provided in the Royal College of Surgeons for a Hunterian oration which was at first delivered annually but latterly bi-annually by the President of the College. These orators have described this remarkable man as botanist, comparative anatomist, biologist, geologist, naturalist, physiologist, pathologist, and surgeon.

His life and work have served as an inspiration to many of his successors even in modern times. One recalls the hero worship exhibited by John Chiene, Professor of Surgery in the University of Edinburgh, who died a few years ago. He studied the methods of John Hunter with meticulous care and was never tired urging his students to emulate him. An amusing incident occurred when, on one occasion Chiene wished to hire a coachman. A man presented himself as an applicant for the position. "What is your name," said Chiene in his direct manner of approach. "John Hunter" was the reply. "You need no further reference" said Chiene, "get on my box!"

We have already referred to the fact that men who were pioneers in establishing new

doctrines were inevitably subjected to adverse criticism by many of their contemporaries. Edward Jenner a distinguished pupil of Hunter discovered the efficacy of vaccination against smallpox in 1798. An immense saving of human life has resulted from this contribution of Jenner to medicine and yet we read that Jenner's life was embittered by the controversies to which his discovery led. He was described as an "amiable, virtuous and accomplished man" and was much disturbed by the petty squabbles which ensued and which were utterly abhorrent to his nature. Medical men of our own day practising in the light of science, are a unit in recognizing the value of vaccination. Certain of the lay public still oppose it. We freely acknowledge the literary genius of Bernard Shaw, but when he attempts to dabble in science his opinions are wholly worthless and negligible. In his opposition to vaccination he is clever and amusing in his phraseology but the subject matter of his discourse proves him to be illogical and unable to understand the first principles of scientific proof. Were he to have his way the growth of truth would indeed make slow progress.

The introduction of ether for surgical anæsthesia dates from October, 1846, when Dr. Morton administered ether to a patient in the Massachusetts General Hospital, Boston, for the removal, by Dr. John Collins Warren, of a tumour from the neck. There seems to be just claim, however, that Dr. C. W. Long of Jefferson, Georgia, had used ether for anæsthetic purposes as early as 1842. In fact his practice was "ether with operation cost two dollars and ether without operation twenty-five cents." It is related that when it was proposed to erect a monument to the discoverer of ether at the Boston Hospital, Dr. Oliver Wendel Holmes suggested they should erect a tablet and place the names of Morton and Long in one line while above would be the inscription "To Ether" (either).

When in 1847 Sir James Y. Simpson introduced chloroform as an anæsthetic we are told that his uncompromising advocacy of it in obstetric practice and in surgery gave rise to "the angriest and most widespread controversy of his time." In Scotland and elsewhere it was thought that pain as a punishment should be received in a spirit of meekness; anæsthesia seemed to be an attempt to thwart the divine will. In the pulpit passages were quoted to prove the wickedness of such undertakings. Simpson came back at his critics by suggesting that they had forgotten the twenty-first verse of the second chapter of Genesis where the first surgical operation was recorded; the Maker of the Universe, before he took a rib from Adam's side, for the creating of Eve, caused " a deep sleep to fall upon Adam." The enlightened lay public of course gave Simpson their support in spite of the religious bias created by the suggestion that it was an impious attempt to remove the primal curse on women. Finally opposition faded away when Queen Victoria gave her consent to use chloroform on the occasion of the birth of Prince Leopold in 1853.

Many examples might be given of the contributions to medical progress by those who worked and laboured successfully in the field of scientific research. We acknowledge our debt of gratitude to such men as Morgagni, Bichat, Laënnec, Charles Bell, Magendi, Johannes Müller, Claude-Bernard, Virchow, Pasteur, Lister, and finally the man whose memory we Canadians are always proud to honour, William Osler.

The outstanding contribution to medical science in the nineteenth century was that made by Lister. No single individual in the history of medicine has accomplished results so far reaching and so beneficent in their effect in mitigating the ravages of human suffering and disease. From student days Lister was gravely concerned because of the great mortality attending surgical operations. Erysipelas, pyæmia and hospital gangrene were rife in the surgical wards of every hospital. Lister sought to explain these dread complications in surgical procedures. As early as 1861, he taught that "suppuration in wounds was determined by the influence of decomposition or putrefaction in the discharges" (Stewart). The cause of the putrefaction he did not know. It had been thought to be due to some mysterious action of the atmosphere. Pasteur, who began his epoch making researches as a chemist, became interested in and finally solved the problem as to the causes of fermentation. He showed that alcoholic fermentation was due to the vital activity of the yeast plant, a living organism. This led to further research to determine the cause of putrefaction. Here, too, he found vital

phenomena and finally determined the rôle played by living organisms of microscopic size as the primary cause of putrefactive processes.

Now let Lister speak himself as to the influence of Pasteur's discovery on the problems with which he wrestled. In his original paper in the *Lancet*, 1867, he writes:—"Turning now to the question of how the atmosphere produces decomposition of organic substances, we find that a flood of light has been thrown upon this most important subject by the philosophic researches of M. Pasteur, who has demonstrated by thoroughly convincing evidence that it is not to its oxygen or to any of its gaseous constituents that air owes this property, but to minute particles suspended in it, which are the germs of various low forms of life, long since revealed by the microscope, and regarded as merely accidental concomitants of putrescence, but now shown by Pasteur to be its essential cause, resolving the compound organic compounds into substances of simpler chemical constitution, just as the yeast plant converts sugar into alcohol and carbonic acid." Thus it came about that the germ theory of disease was established and Lister's antiseptic system in operative surgery based upon it, was finally brought to such a successful issue that the entire field of surgery was revolutionized, resulting in the saving of human life and in the prevention or amelioration of human suffering.

It should be noted that Lister utilized discoveries made in pure science by Pasteur and Tyndall and was able to apply these discoveries to the surgical treatment of wounds. This was made possible because, as Stewart says in his recent most excellent and delightful Listerian Oration, because "his sound knowledge of chemistry and his long series of microscopic researches had prepared his mind to accept Pasteur's teaching." Or as Lister himself puts it: "when it had been shown by the researches of Pasteur that the septic property of the atmosphere depended, not on the oxygen or any gaseous constituent, but on the minute organisms suspended in it, which owed their energy to their vitality, it occurred to me that decomposition in the injured part might be avoided without excluding the air by applying as a dressing some material capable of destroying the life of the floating particles."

The direct result of Lister's life and work may be understood if we note the development of surgical procedures which would have been impossible had he not overthrown the demon of wound infection. To illustrate this point let me quote from a paper written in 1873 by Erichsen, a prominent surgeon of University College Hospital and with whom Lister, in his early days worked as house-surgeon. Erichsen was writing on the finality of surgery as he conceived it at that date, he says, "The art of surgery, like all other manipulative, plastic, or imitative arts, can only be carried to a certain point of excellence. That we have nearly, if not quite, reached the final limit, there can be little question. When we reflect that every large artery up to the aorta itself has been ligatured, that the amputation of each limb up to the shoulder and hip joints is a matter of ordinary occurrence, that large tumours having the most intricate anatomical connection have been removed from every surgical region of the body, from the base of the brain to the lowest organ of the pelvic cavity, we can scarcely believe that much remains for the daring of the boldest to devise, or the skill of the most dexterous to accomplish, in the extension of operative surgery."

It is instructive to note that at the time this eminent surgeon was writing on the finality of surgery, the abdominal cavity was almost never opened except for the operation, then rare, of ovariotomy; the word "appendicitis" was not even coined, and according to my senior colleague in surgery in Toronto, should never have been coined, as its etymology is incorrect! The first operation for removal of the appendix in acute inflammation was performed in 1884 by Kronlein, and the first interval operation by Charters Symonds, in 1885. To-day the average general surgeon performs more operations on the appendix than on any other organ of the body. Not only in the case of the appendix, but in that of all other abdominal organs, the advance in surgery has been by leaps and bounds since the introduction of Lister's methods. We might say the same of cranial surgery and that of other regions of the body. Since the first removal of a tumour of the brain by MacEwen in 1883, and the subsequent development of operative technique in the surgery of the brain, primarily through the genius of Horsley, an enormous amount of successful

work in this field has been accomplished. The lesson is obvious; let us hesitate to believe that the final issue is ever reached as long as man's industry and ingenuity is being employed to unfold the mysteries of science. There are many problems in science which await solution, and who can tell what developments in surgery may result in the solving of them?

We have endeavoured in this paper to show how scientific methods have been utilized in advancing the practice of medicine and surgery. We note three distinct phases in the evolution of the scientific method as applied to medicine:

1.—Accuracy of observation, an essential feature of all scientific investigation, as practised by the ancient Greeks (Aristotle, Hippocrates, Galen, etc.) and later by Vesalius in the sixteenth century.

2.—The experimental method introduced by Harvey in the seventeenth century.

3.—The utilization of discoveries made in pure science. Men confronted with problems of disease, by further observation and experiment were able to apply these discoveries in practical medicine. Lister introduced this method when he followed up the work of Pasteur, the chemist and biologist, and evolved the antiseptic system which revolutionized the whole field of surgery and which proved to be one of the greatest boons ever conferred upon humanity.

This gradual evolution of the scientific method in medicine has had far reaching results. Not only has there been remarkable improvement and progress in the treatment of disease and in preventive medicine but medical men are educated so that they are able to utilize the discoveries of pure science in their clinical work. To-day the student is trained so that he can use the methods of the physicist, the chemist, the biologist or the physiologist at the bed side. Medical education, as it is carried on to-day is an intensive study to fit a man for scientific research. Every patient is a problem in research. The student to-day is required to pass an entrance examination with honours in those subjects which fit him for an exacting course of six years' duration. The primary years require more time in order that he may get a sufficient knowledge of the fundamental sciences. The final years are lengthened because he must be taught to apply the methods of the laboratories of science at the bed side. The university curriculum in medicine to-day must inevitably fulfil the requirements necessary to fit a man to employ scientific methods in the treatment of disease and to utilize the advances made in science from time to time in the relief of suffering humanity.

Few men have possessed the genius of Lister or that quality of mind which Stewart describes as his "almost mysterious insight into vital processes." The storm of opposition which he met from many of his contemporaries, including the eminent President of the Royal College of Surgeons of the time, is inexplicable to us when we read Lister's writings in which he produced proof, so convincing in support of his contributions that we stand amazed. The explanation is found in the fact that men of his time were not trained to assess the value of scientific dogma. They were not educated in the scientific laboratory. They consequently did not possess the receptive qualities necessary to grasp the truth. Education in medicine to-day has created a profession which is capable of assimilating those discoveries in science which may help them in their attempts to combat disease and to preserve the health of the public.

Science has contributed much to lighten man's burden in many walks of life. It is fortunate that the methods of science are contributing and have contributed to that highest achievement of all, the preservation of health and the alleviation of human suffering.

Sugar Threshold in One Hundred Cases of Diabetes.—The sugar threshold in 100 cases of diabetes was determined by Joseph R. Roe and Oliver J. Irish, Washington, D.C., and showed beginning sugar excretion levels ranging from 80 to 310 mg. of blood sugar. It is concluded by the authors that coexistence of nephritis with diabetes is apparently the cause of the very high sugar thresholds found. These facts are taken to show the importance of blood sugar findings and the insufficiency of urinary sugar examinations in diabetes.—*Jour. Am. Med. Ass.*, May 9, 1925.

THE MANAGEMENT OF GASTRIC AND DUODENAL ULCERS

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THE debate which has been carried on consistently for so many years as to whether gastric and duodenal ulcers are the property of the surgeon or the internist, is gradually solving itself as the result of a more thorough appreciation of the physiological principles underlying digestion. It is not so long ago that the diagnoses of gastric or duodenal ulcer, or of gastric cancer, were made as a result of an analysis of the gastric content following the classical Ewald test meal. In recent years this means of diagnosis has been relegated to antiquity, because of the work of Rehfuss, and his development of the standardized analysis of gastric contents, known as the fractional test meal. Using this method, he has demonstrated alterations in the free and combined acid of the gastric content in healthy students which were not dreamed of previously, and has shown that these bear a constant and definite relationship to the various phases of gastric digestion.

In the early development of the surgical therapy of peptic ulcer, operation was never undertaken except where there was incontrovertible evidence of obstruction. As we all know, a gastro-enterostomy in such a condition gives most brilliant results. As the evolution of abdominal surgery progressed, the clinical diagnosis of ulcer was made by the internist, and the case handed over to the surgeon, who automatically did a gastro-enterostomy without confirming the presence or absence of an ulcer. After such a procedure, the results left much to be desired (as in many cases the lesion was in the stomach or duodenum) and were not all comparable with the excellent results of a gastro-enterostomy in the presence of an organic obstruction. From these facts the conclusion was reached that the excellent original results were explained by the presence of the obstruction. Thus pyloric exclusion, with all the various technical procedures, became the fashion, and yet, despite this, the results left much to be desired. In view of the above, we arrived at our present idea of the underlying cause of gastro-intestinal symptoms, namely, interference with motion, due to spasm or organic obstruction in the region of the ulcer. To-day no surgeon would contemplate a gastro-enterostomy or other operation for ulcer, without first convincing himself that there was a definite organic ulcer present.

With this evolution in the purely technical side of ulcer therapy, has arisen the necessity of interpreting gastro-intestinal symptoms as altered normal physiological phenomena. It is felt that all symptoms of gastro-intestinal disease, no matter where located, are the direct result of interference with normal physiological motion, i.e. delay in the normal onward flow of gastro-intestinal contents. Such may be due to atony of the musculature, or to spastic or to organic obstruction. In order to appreciate the factors responsible for normal motion, we must take cognizance of the dual nerve supply of the gastro-intestinal tract. As far as gastric and duodenal lesions are concerned, the dual supply is the sympathetic fibres controlling the pyloric sphincter and the vagus fibres controlling the rest of the musculature in the stomach and duodenum; hence we can immediately visualize lesions causing reflex disturbances, situated elsewhere than in the stomach or in the duodenum. Such areas are of necessity intimately associated with this duplicate nerve supply. Lesions in such sites cause an upset in the normal motion of the pylorus, due to lack of co-ordination of the vagus and the sympathetic neuro-muscular apparatus in the stomach and the pylorus respectively.

The two regions where such lesions are most often situated are, first the biliary tract, where we have the sphincter of Oddi, controlled by the sympathetic nervous system, as well as the vagus supply to the other portions of the tract, and in the ileo-cæcal region, where we have the

ileo-cæcal sphincter, controlled by the sympathetic nervous system, and the rest of the gut controlled by the vagus. Clinically we know that lesions in these two areas may produce reflex spasm in the region of the pylorus, thus simulating a true intrinsic gastric or duodenal lesion.

If our hypothesis regarding the cause of symptoms be correct, then motion in the stomach or duodenum can be altered only by an obstruction. Such obstruction must be due either to organic scarring, or to muscle spasm. The spasm may be situated in three areas: in the stomach proper, in the pylorus, or in the duodenum. Thus our only clinical method of determining the site of the spasm lies in the interpretation of the symptoms in relation to the intake of food, and in relation to the normal rate of flow in the tract. As an example, the most easily demonstrable cause of pylorospasm is the terminal ileal kink. In this lesion the symptoms have a very constant relationship to the ingestion of food, which can be interpreted farther afield in relation to the time of day. The clinical history of such individuals suffering from so-called indigestion, is that they feel well in the morning and enjoy their breakfast, are not so enthusiastic about lunch, and in the afternoon feel wretched, and have no appetite for dinner. This we can explain. Because of obstructive phenomena, they are carrying in their terminal ileum breakfast and lunch for an unduly long time, producing a reflex interference with motion in the stomach, causing a lack of normal tonic contraction, in which state the stomach exists in hunger. Such an indigestion, coming on in this way, is most unlikely to be due to an intrinsic lesion of the stomach or duodenum. The proof that this lesion is the result of such a mechanical condition is easily demonstrated by asking the individual to refrain from anything but fluids for the noonday meal, following which his indigestion will immediately disappear.

In the duodenal and gastric lesions on the other hand, the symptoms are more closely related to the individual meal. That the symptoms are the result of spasm and not the result of the irritation of food passing over an ulcerated surface, as used to be thought, can be proven by the fact that radiographically one can demonstrate an ulcer on the lesser curvature which, having penetrated all the muscular coats, no longer produces muscle irritability, and hence no muscle spasm. The individual with an ulcer which has penetrated through the whole thickness of the stomach will have no symptoms or will have continuous symptoms irrespective of the intake of food. The latter are due to a peri-gastric inflammatory reaction, the result of the penetration of the ulcer into adjacent structures. One of the fairly constant clinical findings in such an ulcer is the immediate relief which such patients experience on lying down, and the sudden reappearance of their pain on assuming the erect posture. This is possibly the result of a drag by the stomach on gastro-hepatic omentum which has become involved.

Furthermore, there is a very definite difference in the symptoms of the individual suffering from a gastric ulcer, as compared with those suffering from a duodenal ulcer. The individual with a duodenal ulcer approaches the meal with the so-called "hunger pain." This hunger pain has been demonstrated by Carlson to be due to a hyper-tonicity of the whole gastric musculature. The relief from the pain in duodenal ulcer which follows the ingestion of food is due to a relaxation of this spasm of the whole stomach. The pain, however, returns in a variable time, to persist until food again enters the stomach; hence the great virtue of the so-called Sippy diet lies in the frequent feedings, which always leaves some food in the stomach, and thus prevents this hypertonic contraction, with the resultant pain.

The patient with a gastric ulcer, on the other hand, has frequently no distress prior to the taking of food. Because there is not immediately initiated hyper-tonic gastric contraction, there is no distress immediately on taking food. In a very short time, however, this occurs, and it is believed to be due to a spasm set up in the gastric musculature, due to the irritation of the inflammatory reaction about an otherwise normally contracting stomach. This pain will persist until the stomach has emptied itself and assumed a state of rest, i.e., the pain does not persist until food is again taken, as in duodenal ulcer; hence the efficacy of the

duodenal tube in the treatment of gastric lesions, as it can allow the stomach to maintain that state of absolute rest which is so essential to the avoidance of further spasm, with resultant freedom from pain.

Assuming the above to be true, one can fairly accurately arrive at a diagnosis of duodenal ulcer and a reasonably accurate diagnosis of a gastric ulcer. One must, however, confess that the bizarre character of the symptoms in so many gastric ulcers, which I believe are largely the result of peri-gastric involvement, so confuses the relationship between the intake of food and the occurrence of symptoms, that the diagnosis is often uncertain.

Before one can dogmatically outline definite treatment for any disease, it becomes necessary to determine the cause. The etiology of peptic ulcer is unknown. There is a definite relationship between foci of infection and the presence of ulcer. This I believe no one can doubt. Because of the close association of the sympathetic neuro-muscular apparatus with the physiological process in gastric digestion, I feel that environment, fatigue, worries and other emotions must play a part in the persistence of symptoms. The treatment of individuals suffering from ulcer must of necessity include the correction of these two important factors, in addition to the therapeutic procedures dealing directly with the ulcer.

In order to determine the cases which must have surgical therapy in addition to dietetic control, we are guided by the following indications: first, the stenosing ulcer, causing organic obstruction; second, the individual who will not respond to dietetic control; third, the individual who responds to dietetic control and remains symptom-free so long as he is on a very severely restricted diet and under ideal environment, whose symptoms immediately return on his resuming normal work; fourth, the individual who economically cannot afford the time necessary for proper dietetic treatment, with the possibility of a failure, resulting in a further period away from work. The minimum time for medical and dietetic treatment of ulcer is one month in bed, followed by a very markedly restricted work period and a carefully selected and controlled diet for a further two months. This requirement in the case of the ordinary hospital patient with a family to support, is very often an economic impossibility. The fifth indication includes the perforated ulcers.

Of these five groups, the first and the last leave no room for argument. The other three will present many less patients for surgical therapy if the physician will realize that ambulatory dietetic treatment for ulcer is almost inevitably unsatisfactory.

It will be noted that hæmorrhage has not been mentioned as of itself being an indication for surgical therapy. The cases in which an emergency operation is advisable solely because of hæmorrhage, are extremely rare, and in many cases in which an emergency operation for hæmorrhage will be undertaken, no gross pathological lesion will be found.

The technical procedures in dealing with ulcers of the duodenum and stomach vary in fundamental principles, because of the fact that carcinoma of the duodenum is exceedingly rare. Whenever possible the involved tissue in the duodenum should be removed either by the cautery or a knife excision. It is advisable to do, whenever possible, a reconstructive type of operation after the excision of the involved tissue, rather than a gastro-enterostomy, which may result in a marginal ulceration .

In gastric ulcer, on the other hand, we have the *bête noire* of carcinoma being engrafted on ulcer, as a real possibility. A recent survey of the gastric ulcers in the Toronto General Hospital has been made by Dr. Wookey, and he found eighteen per cent of ulcers clinically diagnosed as benign were proven histologically to be carcinoma. This emphasizes the importance of excising, whenever possible, the ulcerated area either by means of the cautery or the knife. We feel that the latter, when technically possible, is more likely to result in thorough eradication of the disease. Such excisions so commonly produce a deformity of the stomach, that such should be anticipated by doing a gastro-enterostomy and placing the stoma in such a position as to drain both segments of the stomach, should an hour-glass develop. In certain cases it is safer and technically easier to do a partial gastric resection, than to attempt a local resection.

In the large ulcers situated near the cardia on the lesser curvature, and in the penetrating adherent posterior wall ulcers, in which prac-

tically no type of radical excision is technically possible, it is advisable to open the anterior wall of the stomach parallel to its long axis in a segment of stomach opposite the ulcer, cauterizing it as thoroughly as possible, and oversewing the mucous membrane. This also serves the additional purpose of putting that segment of stomach absolutely at rest, and by suturing the excision transversely to the long axis, avoids an hour-glass which might follow the healing of the ulcer. Such a procedure should be coupled with a gastro-enterostomy.

Regarding the position of the stoma, it is considered that this should be placed near the greater curvature opposite the incisura, rather than near the pylorus. In instances where the stoma has been placed near the pylorus, we have found a very rapid emptying of the stomach, with persistence of distress after meals.

Further, one must not regard any surgical therapy for ulcer as the final treatment of the case. We have been accustomed to place our patients on a very strict dietetic régime for a period of six months, each patient on discharge from the hospital being given the following instructions:—

"After your discharge from hospital, the most important factor in securing a good ultimate result is a rigid adherence to the well-accepted, common-sense principles of life, avoiding excesses of any sort, particularly undue fatigue, breaking up the work period by short rests whenever possible, for the first six months never standing when you can sit down, and never sitting down when you can lie down. You must, however, not consider yourself an invalid, but by carrying out a fairly strict régime for six months, you should have an excellent result. You will probably enjoy better health immediately than you have had for years, but this is no indication that you can take liberties with regard to irregularities in diet or excessive work, either mental or physical.

"Your diet list for these six months broadly should include the following: Soups; any light soup. Meats; any of the easily digested meats, sweetbreads, red beef, mutton, lamb, poultry. These for the first two or three months at least should be put through a meat chopper, and should be broiled or boiled. Fish; mainly the white variety, fresh water fish preferable; oysters, boiled or raw. Eggs; in any form except fried. Vegetables; (for the first two or three months these should be mashed and strained, or put through a food chopper), the easily digestible kinds, such as asparagus, spinach, peas, beans, potatoes and carrots. Any of the cereals can be taken, but oatmeal and similar porridge should be cooked thoroughly in a double boiler. Fresh bread should be avoided, but bread a day old may be taken. Desserts; any of the light puddings. Fruits; mainly stewed fruits. Fatty foods; cream, butter and olive oil. Drinks; milk, buttermilk, cocoa, carbonated mineral waters, and an abundance of plain water."

"The following must be avoided:—Rich soups, fried foods, pork, veal, stews, hashes, corned meat, potted meat, twice-cooked meat, liver, kidney, duck, goose, sausage, crabs, sardines, lobster, preserved fish, smoked fish, salted fish, salmon, cauliflower, celery, radishes, cabbage, cucumbers, sweet potatoes, tomatoes, beets, corn, salads, bananas, melons, berries pineapple, hot bread or cakes, nuts, candies, pastry, preserves, cheese ,strong tea, strong coffee, alcoholic stimulants, and any excessive condiments.

"The use of tobacco should be dispensed with for three months, and then used in moderation, preferably only after the evening meal, but at any rate never before luncheon.

"This diet will allow of a certain laxity after three months, but for the first three months it is considered very important that you follow it fairly rigidly. During the first three months it is essential that you should avoid trying to carry on with three main meals. Rather you should supplement these by malted milk, eggnog with toast, or some such light nourishment at 10 a.m., between 3 and 4 p.m., and before retiring. If there is any return of pain similar to your former distress, report to your physician at once."

An Unusual Case of Mercurial Poisoning.—Jeannette M. Shefferd, Fall River, Mass, reports the case of a man who suffered from mercurial poisoning contracted from anointing himself at one time with three ounces of mercurial ointment sold him by a druggist for pediculosis pubis.—*Jour. Am. Med. Ass.*, March 21, 1925.

THE PRESENT STATUS OF HEPATIC EFFICIENCY TESTS*

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ANY attempt to estimate the functional capacity of the liver is at once beset with difficulties. In the first place, the normal functions of this organ are still but vaguely understood. The liver subserves not one function but several; insufficiency of one hepatic function does not necessarily imply insufficiency of all the functions. It is a well recognized fact that the liver possesses an enormous reserve capacity. Experimentally, at least seventy per cent. of the organ can be removed without producing any apparent effect on the animal's general condition.[1] Furthermore, the hepatic tissue is capable of undergoing compensatory hypertrophy to a remarkable degree[2]. The liver does not lend itself readily to investigation; its specific product, the bile, is not easily obtainable, at any rate, quantitatively. Moreover, the chemical and biological technique involved in many of the tests demand time and skill for their proper conduct. Also, one has, at times, to consider the matter of convenience to the patient.

Any test of function, to be of value, should be based upon physiological facts or depend upon some specific property possessed by the organ in question. Although many problems in liver physiology remain as yet obscure, the hepatic functions may, for purposes of discussion, be grouped as metabolic, secretory, pigmentary and antitoxic. Efficiency tests based on all these various activities have been devised.

Metabolic Function.—The liver is concerned in the metabolism of carbohydrates, proteins and fats. *Carbohydrate metabolism*: The liver converts monosaccharides, absorbed from the intestine, into glycogen, which it holds until such time as the tissues require sugar, when the glycogen is reconverted into dextrose.

The liver does not take up and store all monosaccharides with equal facility. In the case of lævulose, glycogenesis is particularly active and as Maclean and de Wesselow[3] pointed out, it is the only sugar in ordinary use which does not produce a rise in blood-sugar concentration. This observation naturally lead to a study of the phenomenon under pathological conditions, on the supposition that a damaged liver would permit a lævulose hyperglycæmia, the degree and duration of which would be proportional to the amount of liver insufficiency. Subsequent work has proved this assumption to be more or less true. A definite rise in the blood-sugar concentration of 20 mg. per cent. or an unusually prolonged blood-sugar curve after the ingestion of 50 gm. of lævulose suggests impairment of at least one of the liver's functions[4]. Of course, the same results might be obtained if the glycogenic power be disturbed by some factor outside the organ itself as, for example, in diabetes mellitus or certain other endocrine dysfunctions.

The relation of lævulose intolerance to liver damage has been known since 1898, when Strauss[5] first introduced the lævulose test. Observations were then limited to examining the urine for sugar after the ingestion of 100 gm. of lævulose. The test proved unreliable in the hands of various workers, owing no doubt, to the unknown and variable factor of renal permeability. It received only meagre attention until recently when it was revived and studied in the light of modern biochemical methods. We have in the lævulose tolerance test, as now carried out, one of the most useful of the many hepatic efficiency tests but like other of these tests, it responds more to the acute and advanced types of liver disease than to the chronic and mild types.

Protein Metabolism:—There is experimental evidence to show that in animals the liver is largely concerned with the production of urea[6]. It is assumed that such is the case in man,

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although urea formation is not necessarily confined to this organ.[7]

The amino groups are removed from the amino-acid molecules and converted into urea through the stage of ammonium carbonate. Theoretically, any loss of this deaminating and urea-forming function ought to be revealed by decreased urea and increased ammonia and amino-acid excretion in the urine; with the presence of severe destructive alterations in the liver this does occur. The values, however, lose much of their significance when it is recalled how dependent are the nitrogenous constituents of the urine upon diet, general tissue metabolism and renal efficiency. Similar changes, at least increased ammonia and decreased urea, may be associated with an acidotic condition independent of liver disease.

The amino-acid content of the urine should, therefore, furnish more definite information and as a matter of fact, the amino-acid nitrogen has been shown to be unusually high in hepatic disorders.[8] Also, after feeding an amino-acid (glycocoll) the liver was apparently unable to convert it into urea and it was excreted in part unchanged.[9]

In view of the complex nature of protein metabolism in general, these nitrogen partition tests have not had wide clinical use as methods for investigating hepatic disabilities.

Fat Metabolism:—The rôle of the liver in fat metabolism, as pointed out by Leathes,[10] appears to be the preparation of the fats for utilization by the tissues. There is apparently, as yet, no practical test for detecting disturbances of this specific function. The fat droplets in the blood, as seen under the microscope, with dark-ground illumination, are said to be diminished in chronic liver disease.[11]

Under normal conditions, the blood contains a very constant amount of fat-splitting ferment. In liver disease, this lipase is increased.[12] Why this should be so, is difficult to understand. The suggestion has been made that normally, the liver inhibits the formation of lipase. Perhaps normally, the liver deals in some way with lipase absorbed from the intestine but in its injured state is unable to do so and allows the enzyme to pass into the general circulation increasing its concentration there. Normal plasma or serum shows a lipase value, as measured by the power to split ethyl butyrate, of 0.2 to 0.3, expressed in terms of cc. of decinormal acid. With the presence of hepatic lesions, it may be increased five or eight times the normal amount.

This test lacks dependability and is capable of indicating only the more acute and gross types of liver damage.

Secretory Function.—It would appear that the bile salts and the bile pigments originate separately; only the salts being a direct product of the liver. The bile salts, normally, play an important part in aiding digestion and absorption in the intestine, particularly of fat. Consequently, when bile fails to reach the intestine, these processes are incomplete, which fact may be ascertained by examination of the fæces, qualitatively or quantitatively.

So far as known, the only condition causing bile salts to appear in the urine is biliary obstruction. Bile salts and bile pigments need not occur together and as a matter of fact, bile salts are by no means always found in the urine in jaundice. Bearing in mind the differences in origin and properties of these two biliary substances, this does not seem remarkable. Early in obstruction of the bile ducts, bile salts may be present in the urine before any bile pigment is detectable or before there is any obvious discoloration of the skin, because the bile pigment must reach a certain concentration in the blood before any of it escapes into the urine or before there is any evident icterus. If the obstruction persists, the cells of the liver may undergo degenerative changes. Thus a primary obstructive jaundice may become complicated by a functional derangement of the liver parenchyma, the power of the liver cells to manufacture bile salts suffering along with the other functions. In this way, is explained the observation that in the later stages of obstructive jaundice bile pigments but not bile salts are found in the urine. The term "dissociated jaundice" has been applied to the occurrence of one but not the other of the biliary constituents in the urine.

Excretory Function.—The excretory function of the liver is concerned, for the most part, with the elimination of bile pigments and cholesterol. The relation of the liver to cholesterol metabolism is not yet understood and the association of hypercholesterolæmia to gall stone

formation is still a disputed question. A study of the cholesterol content of the blood in various hepatic disorders has shown such discordant results that no definite conclusions can be drawn.[13, 14]

The fact that the liver will excrete certain dyes after their injection, has been made the basis for many hepatic function tests. Several dyes have been used, including methylene blue,[15] congo red,[16] indigo carmine,[17] azorubin S,[18] rose bengal,[19] bromsulphalein[20] and phenoltetrachlorphthalein.[21] The last named has received the most attention. The use of phenoltetrachlorphthalein as a liver function test, arose from the observation of Rowntree and Abel[22] in 1909 that this substance when injected into the circulation is eliminated solely by the liver. Recently, the truth of this has been questioned.[23]

The original test was carried out by injecting 400 mg. of the dye and recovering it from the fæces. This method was at once objectionable, cumbersome and inaccurate. The advent of the duodenal tube brought about a modification of the test in that the dye was recovered through the tube.[24] This technique still has its adherents but has been superseded by a still later modification, introduced by Rosenthal[25] in 1922, namely a determination of the rate at which the dye leaves the blood stream. In doses of 5 mg. per kilo. of body weight, it is absent or almost absent from the serum one hour after its intravenous injection. More recently still, this same investigator[26] has advocated the use of bromsulphalein (phenoltetrabromphthalein sodium sulphonate) as having certain advantages over phenoltetrachlorphthalein. It is used in much the same way but in smaller dosage (2 mg. per kilo.) Under normal conditions the serum is entirely free from this dye-substance thirty minutes after its injection. Bromsulphalein is said to be more sensitive to liver injury than the "tetrachlor" compound.

It is claimed that retention of these dyes affords a quantitative index of hepatic insufficiency. Opinion is by no means unanimous concerning the truth of such claim. It is, perhaps, as yet, too early to pass final judgment on the usefulness of these dye tests. They are valueless in obstruction of the bile passages but in the absence of obstruction, a positive test probably means serious liver damage. It remains, however, to be said that the use of phenoltetrahalogen compounds is not without danger. Besides local irritation to the tissues at the site of injection, they are capable, themselves, of producing acute liver necrosis.[27,23]

Pigmentary Function.—Bilirubin: As already inferred, there are reasons for believing that bile pigment formation takes place wholly or in part outside the liver.[28, 29] The spleen would seem to be the organ chiefly concerned in the manufacture of bilirubin from hæmoglobin. The Küpffer cells of the liver, inasmuch as they form a part of the reticulo-endothelial system, may play a subsidiary rôle. The bilirubin or precursor of it, passing from the spleen through the liver is picked out by the cells of the liver and transported from the vascular capillaries to the bile capillaries to be excreted. The modern aspect of clinical jaundice is based upon such a conception of bile pigment formation.[30]

Van den Bergh,[31] searching for a satisfactory test for bile in blood serum, re-discovered, as it were, in 1918, the Ehrlich-Pröscher reaction and put it to practical use. The reaction consists of a pink or violet color which is given by bilirubin in the presence of the diazo reagent of Ehrlich. Van den Bergh made the original observation that in the serum of patients with obstructive jaundice the color became maximum almost at once (direct reaction); whereas with other types of jaundice, the colour developed only on standing or after precipitation of the proteins with alcohol (indirect reaction). This difference in reaction probably means that the bile pigment in traversing the cells of the liver has had its chemical or physical properties altered in some way. The nature of the change is not yet decided.

Theoretically, such a test would appear to have many possibilities. Practically, the matter of interpretation sometimes proves confusing. In outspoken obstructive jaundice, the "direct reaction" of Van den Bergh is obtained. In hæmolytic jaundice or that dependent upon functional defect of the liver cells, the "indirect reaction" is obtained. If there exists a combination of obstruction with one of the other factors, both varieties of pigment will be pre-

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sent in the blood and a "bi-phasic reaction" will result. Damage to the liver cells may be associated with or secondary to biliary obstruction, either as a result of bile retention *per se* or of concomitant infection. Thus a direct reaction may give place to a bi-phasic reaction in obstructive jaundice; also a bi-phasic reaction is the rule in catarrhal jaundice. This bi-phasic type of reaction tends to limit the clinical value of the method. Nevertheless, the Van den Bergh test fulfils a useful purpose and deserves a place in the laboratory along with other routine methods of clinical investigation.

Since the adaptation of this method to the quantitative determination of serum bilirubin, some interesting facts have been evolved. Normal human blood serum contains a small amount of bile pigment, which can be detected only by the indirect reaction. The normal bilirubin content of the serum is 0.2 to 0.5 of a unit (a unit of bilirubin being one part in 200,000). The colour of the skin gives no true indication of the bilirubin content of the blood; therefore, the presence of jaundice can be proved, its nature and intensity determined only by a study of the serum bilirubin. There is a renal threshold for bile pigment. In obstructive hyperbilirubinæmia, there is no biliuria until the pigment concentration of the serum has reached four units, i.e. 1 in 50,000. On the other hand, in hyperbilirubinæmia due to the type of pigment which gives the indirect reaction, there is no biliuria at all because the kidney is impermeable to this variety of pigment. The urine in these cases, however, often contains an excess of urobilin.

"Latent jaundice" is a term which indicates a degree of hyperbilirubinæmia insufficient in amount to colour the skin or give rise to biliuria. Such a state may be present in pernicious anæmia, cirrhosis of the liver, metastatic tumour growths, cholecystitis and toxic hepatopathies as for example that which may result from the use of arsphenamin. The importance of recognizing a condition of latent jaundice is obvious.

Urobilin: The association of urobilinuria with liver disease was recognized as early as 1892 by von Jaksch.[32] The relationship is not quite clear but is explained on the assumption that a damaged liver is unable to deal with the urobilinogen which is returned to it from the intestine, allowing it to pass on into the general circulation to be removed by the kidneys.

Urobilinuria is by no means pathognomonic of hepatic disorder. It may occur in conditions unassociated with liver disability as hæmolytic icterus and pernicious anæmia. It may follow obstructive jaundice or accompany intestinal stasis.

It has been shown that the urobilin content of the urine varies somewhat normally.[33] A positive test obtained in urine passed five or six hours after a meal or better in the night urine is suggestive of a pathological state. A simple quantitative test has been devised by Marcussen and Hansen.[34]

The normal colouring matter of the fæces is stercobilin, a substance identical with urobilin and derived from bile pigment in the intestine Absence of bile derivatives from the stools can not always be ascertained by inspection alone. An excess of fat may render the fæces light in color, even in the presence of considerable stercobilin. Only the absence of stercobilin from the stools, as determined by spectroscopic or chemical tests, is proof of complete biliary obstruction.

Antitoxic Function.—A normal function of the liver is to destroy the harmful properties of certain substances absorbed from the intestine by converting them into a harmless form to be excreted by the kidneys. Thus the toxic indol in conjugated with sulphuric acid and eliminated as indican. Glycuronic acid acts in much the same capacity as sulphuric acid. This phase of the liver's activities has been tested in numerous ways, chiefly by the ingestion of certain drugs which after absorption become converted in the liver to glycuronates. Seven and a half grs. of camphor, by mouth, should be completely conjugated with glycuronic acid. If the liver fails to bring about this combination, the test for glycuronate in the urine will not be obtained.[35] In the same way, ½ gr. of sodium salicylate should be converted into a glycuronate which will not yield a purplish colour with ferric chloride in the urine, whereas if hepatic incompetence exists, this colour reaction will be obtained.[36] Menthol[37] and thymol[38] have also been used in this respect.

These tests have been found valuable by some observers whereas others denounce their usefulness as a means for assessing hepatic function.

The so-called "hæmoclasic crisis" has received considerable attention recently, particularly in Europe[39]. It is said to test the ability of the liver to deal with incompletely disintegrated protein products, proteoses and peptones, absorbed from the intestine. When obtained, the crisis consists of various blood changes, the most constant being a leucopœnia, instead of a leucocytosis as normally, following the ingestion of 7 oz. of milk.

Opinion is again divided regarding the efficacy of this test. It has little scientific basis and on the whole, seems to be unreliable as a liver function test.

Conclusion

The tests of liver function mentioned in this paper are only a few of those available but they are the ones which have received the most recognition clinically.

In conclusion, it may be said that all hepatic efficiency tests are still in the experimental stage of their existence, in which light we should view them until their comparative values have been more thoroughly worked out and more precise data are at hand correlating the functional with the actual pathology.

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Epidemic Encephalitis in Infancy.—C. de Lange, who records two new cases of infantile encephalitis with a review of the literature, remarks that one of the peculiarities of infancy is that cerebral symptoms may occur in all infections and intoxications at this age. As an acute attack of epidemic encephalitis in young children is accompanied by convulsions, tonic contrictions, motor restlessness or apathy, unconsciousness, vomiting, and fever, which do not form a characteristic group of symptoms, de Lange thinks that it may be assumed with great probability that a number of cases pass unrecognized, while, on the other hand, it is likely that an incorrect diagnosis of epidemic encephalitis is often made in young children. Le Lange's first case was an infant aged thirteen months, who in addition to lethargy, myoclonic movements, and exaggeration of the reflexes, showed a remarkable pallor, probably due to changes in the sympathetic centres, and an insatiable appetite, which was attributed to a process in the hypothalamos. A complete change in the child's character also took place. The second case, which occurred in a child of seven months, was characterized by convulsions, exophthalmos, intermittent rigidity, exaggerated reflexes, boulimia, and a respiratory syndrome resembling whooping-cough. Finally, complete recovery took place.—*Nederl. Tijdschr. v. Geneesk*, Nov-29, 1924, p. 2696.

TWO CASES OF ADOLESCENT MYXŒDEMA ACCOMPANIED BY NEPHROSIS, AND IN ONE CASE, TETANY

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THESE two cases coming under my care at approximately the same time offered an interesting study of myxœdema, with and without tetany, and accompanied by nephrosis. The joint occurrence of sub-thyroidism and subparathyroidism is rare, and complicates treatment, since feeding thyroid tends to depress parathyroid function and accentuate the deficiency according to Cameron[1]. Epstein[2] has drawn attention to the occurrence of nephrosis, with accompanying hypercholesterolæmia in subthyroid conditions.

CASE 1.—*Myxoedema with Nephrosis and without Tetany.*—Miss B., age twenty. Born and lived on a farm in Manitoba, until sixteen years old, since when she has been a domestic servant in Winnipeg.

Family History.—Negative.

Previous History.—Nothing of importance.

Present Illness.—After working for three or four months she began to suffer from headaches, dizziness and asthenia, and noticed that her face and limbs were swollen. After resting a few weeks, symptoms disappeared, but reappeared on resuming work, so that from the spring of 1922 until November, 1924, she was able to do very little work. Finally, symptoms persisted whether she was working or resting. She entered the Winnipeg General Hospital in November 25, 1924.

Examination of Patient.—Fairly well developed young woman; rather dull mentally; skin somewhat dry; flesh firm on pressure, hair dry. General appearance that of myxœdema in early stage. Nothing special to be noted about the lungs, heart, and abdominal organs. Menses began at sixteen, and were always irregular, appearing at intervals of three to four months and lasting, at most, two days. Urinary output small (400 cc. or less per twenty-four hours). Distinct albuminuria but no casts or red cells. Chloride output normal and Mosenthal test negative. Blood examination, November 26, 1924. Urea-N, 14.6; creatinine, 1.2; cholesterol, 156 mg. per 100 cc. of blood; calcium 10.2 mg. per 100 cc. serum. Basal metabolic rate, minus 5 per cent (December 1st).

Treatment and Progress.—Up to December 1st the patient was resting in bed on a light diet. She was then placed on a balanced diet of 1,800 calories, and was given light duties in the ward. On the 8th her basal metabolic rate had decreased to minus 22 per cent. She was then placed on desiccated thyroid gland two grains twice a day (containing 0.2 per cent iodine), and kept at work on the same diet. In the course of eleven days her weight fell by five or six pounds, and on December 20th her basal metabolic rate was plus 1 per cent. The albuminuria decreased slowly and occasionally was absent in the twenty-four hour specimens. She left the hospital on December 22nd, being advised to return after Christmas, but has not done so up to the present.

CASE 2.—*Myxoedema with Nephrosis and Tetany.*—Miss M., age sixteen, weight on admission 105 lbs.; born and lived on a farm in western Manitoba. Height sixty-two inches.

Family History.—Nothing known of importance.

Previous History.—In December, 1922, her parents noticed that her face, limbs and body were swollen; the swelling increased during four or five weeks, until the eyelids were almost closed. Towards the end of the following January the swelling subsided somewhat, but convulsions began. For the first ten days there were as many as from thirty to fifty per day, and she remained in an apparently semi-conscious condition. The convulsions gradually lessened in number, but the patient remained apathetic with slow and deliberate speech. This

condition continued unchanged till April, 1923 when there was some improvement though never a complete return to normal; some œdema remained, and there were occasional convulsions. In December of that year the condition of the previous December returned and continued till the following spring, when there was the same partial improvement. On account of her mental state she was sent to the psychopathic ward of the Winnipeg General Hospital in June, 1924, and after a few weeks' observation she was transferred to the medical ward for treatment. A temporary diagnosis of chronic nephritis was made, and after six weeks she was discharged.

In November, 1924, as in the previous two years, her condition became worse, and she re-entered the Winnipeg General Hospital and came under my care on November 15th.

Initial Examination of Patient. — General œdema, with the eyelids so swollen that the patient had difficulty in seeing; apparently stupid and dazed; speech slow and deliberate; memory bad; skin very dry; soles of feet and palms of hands rough and thick; hair dry, coarse, and stiff; flesh hard and firm to the touch with slight pitting on pressure. No marked feeling of discomfort. Lungs and heart normal. Abdomen contained a little fluid in the peritoneal cavity. Menses had begun at thirteen; they were always irregular, with five or six months intervals, and lasted only one or two days. Previous to admission she had not menstruated for several months, and has not done so since. Wassermann reaction was negative. The urine output was low, below 400 cc., chloride content low, 2 to 3 grms., blood urea-N slightly high (24 mg. per 100 cc.), and blood creatinine normal (1.6 mg.). The urine contained over 1 per cent of albumen, with a small amount of pus, and granular and hyaline casts. Red cells were not present.

On November 20th she had a definite attack of tetany, the first since admission to hospital. This commenced with the right hand which assumed the obstetrical position, followed immediately by the left hand, then the arms flexed with pronation; the head turned slightly to the right with facial contractions on the right side. The tonic contractions lasted several seconds, and were followed by clonic contraction. The Trousseau sign was present; Chvostek's sign was negative. There was a second attack on the 23rd.

The blood serum calcium determined on November 23rd, after this attack, was 7.5 mg. per 100 cc., a figure in agreement with the condition and confirming diagnosis of parathyroid deficiency. The basal metabolic rate measured early in the morning of this day was minus 22 per cent, and the blood cholesterol content, also determined on this day was 317 mg. per 100 cc. Blood count on the 24th; red blood cells, 4,400,000; hæmoglobin, 65 per cent; white cells normal. These findings, including the slight decrease in blood cells, indicated definitely a condition of subthyroidism with nephrosis, complicated by subparathyroidism.

Treatment and Progress.—The patient was kept in bed and placed on a balanced diet of 1,400 calories, gradually increased during three weeks to 2,300.

Thyroid treatment was commenced on November 25th; she was given two grains of desiccated thyroid containing 0.2 per cent iodine three times a day. Her weight on that day was 104 lbs., and has decreased steadily to 94.5 lbs. on January 21st. On December 10th, her basal metabolic rate was minus 8 per cent. The thyroid dose was increased to eight grains per day. On December 20th, the basal metabolic rate was minus 1 per cent. The thyroid dose was decreased to six grains per day. On January 4th, the basal metabolic rate was minus 10 per cent. The thyroid dose was increased to eight grains per day. On January 13th, the basal metabolic rate was still minus 10 per cent. The thyroid dose was increased further to ten grains per day. On the 21st, the basal metabolic rate was plus 21 per cent, but this was undoubtedly due to the onset of an attack of influenza. Thyroid treatment was stopped for four days, and then commenced with a dose of six grains per day, and on January 27th, the basal metabolic rate was minus 5 per cent. During this period the output of urine increased to normal. while the albuminuria showed a slight continued decrease. The granular and hyaline casts were greatly reduced in number.

The blood urea nitrogen gradually decreased to just above the maximum normal limit (December 15th and 17th, 18.7 mg. per 100 cc.) The blood cholesterol definitely decreased, though remaining above normal, (December 17th, 203

mg. January 4th, 208 mg.; January 27th, 252 mg.). On January 5th, Dr. McEachern, of the pathological laboratory of the Winnipeg General Hospital kindly measured the serum albumin and globulin, which were respectively 1 and 1.4 per cent; typical figures for nephrosis. On January 27th, the corresponding figures were 1 and 0.5 per cent. Evidently, with the artificial restoration of thyroid function through thyroid feeding, the nephrosis is slowly decreasing.

Attacks of tetany occurred on November 24th, and 30th, and then somewhat more frequently. It is to be remembered that the maximum effect of thyroid dosage is not attained until the tenth day, and when sufficient of the thyroid was given to raise metabolism up to within normal limits, parathyroid deficiency appeared to increase as the tetanic attacks came on more frequently.

Calcium treatment was commenced on November 29th. Ten grains of calcium chloride were given by mouth twice a day; on December 2nd, the dose was given three times a day, and on December 9th, the same dose six times a day. On the 10th she had six attacks, but subsequently only a single attack every second or third day. During the influenza period the calcium treatment was stopped.

On November 26th the serum calcium was 7.5; on December 10th during a tetanic seizure it dropped to 3.7; January 5th, 8.2; January 8th, just after a severe seizure, 6.7, and January 12th, 8.2. The whole-blood calcium, determined on November 27th was 4.5 mg. which was definitely low, and the cerebro-spinal fluid calcium on the same date was 4.7, also a low figure. These figures are in full agreement with the condition in tetany resulting from parathyroid deficiency, but showing slight increase in blood calcium following calcium treatment.

While the calcium treatment did not entirely prevent tetany, yet there was a definite diminution in the number of attacks and in the severity, and the beneficial effect was most marked when the dose was given at the most frequent intervals.

I am indebted to Professor A. T. Cameron, of the department of Biochemistry, for the determinations of blood calcium, and for suggesting the desirability of *frequency* of calcium dosage. This suggestion arose from results of a study of experimental parathyroid deficiency by Professor Cameron and Professor Moorhouse[3].

From the experience obtained in this case it might be suggested that the best effects will be obtained from calcium administration in still smaller doses at three hour intervals.

Through the kindness of Professor J. B. Collip of the University of Alberta, a supply of his concentrated parathyroid extract was obtained for this patient, and treatment commenced with it on January 28th. The results of this treatment will be reported later.

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Effects of Radiations of Cod Liver Oil.—Ultraviolet light is bactericidal. Gates, for example, showed the lethal action of ultraviolet radiations on *Staphylococcus aureus*. To I. A. Manville, Portland, Ore., it seemed reasonable to assume, in view of the foregoing facts, that the reason rats failed to develop infections when raised on diets containing the fat soluble vitamin was the bactericidal action of the ultraviolet radiations that are now known to characterize such fats. In order to prove this hypothesis, bacterial cultures were exposed to cod liver oil. During the exposure, the cod liver oil, rendered alkaline, was oxygenated. The results of these experiments strongly indicate an inhibitory action of cod liver oil on bacterial growth. Besides the action of cod liver oil in curing or preventing rickets, Manville concludes that there are two other specific actions: (*a*) There is a stimulation of cell activity and a distinct inhibitory effect on bacterial growth; (*b*) when these active substances are in excess of the amount producing stimulation, there is exerted a depressing action, the most striking manifestation of which is a lack of fertility. The separation of fat soluble A into two separate vitamins each with a specific action does not seem justified when the effects can be explained as being due to different concentrations of the same principle. —*Jour. Am. Med. Ass.*, May 9, 1925.

THE DIABETIC AS A SURGICAL RISK*

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IN a recent number of the *Archives of Internal Medicine* Dr. Emerson of the New York Public Health Service has presented facts to show the marked increase in incidence and death rate from diabetes mellitus in the United States and especially in New York City. This increase during the past fifty years has been more rapid than that of any other disease for which records are available. To-day in New York City diabetes stands in the tenth place as the cause of death, while tuberculosis has dropped from first to fourth place. In 1866 one death from diabetes was recorded for each 2,437 deaths from all causes, while during 1923, with each fifty-one deaths a death from diabetes took place. In the registration area of the United States, during the last forty years, the death rate from diabetes per 100,000 population has risen from 2.8 to 16.1; this with a falling curve of death rate from all causes.

With this rising death rate from diabetes it is of interest to investigate the part that surgical operations contribute. Formerly the diabetic was a notoriously poor surgical risk. In well equipped clinics the operative mortality varied from 10 to 30 per cent, running even higher in outside practice. To-day with our better understanding of the disease, and with insulin, has the situation changed? Death from diabetic coma *per se* is becoming more and more infrequent while the various surgical complications are rapidly assuming major importance as the cause of death in diabetes. Joslin has recently stated that gangrene is now killing more diabetics than coma.

During the past nine years, January 1, 1916, to December 31, 1924, 631 new cases of diabetes mellitus were admitted to the medical wards of the Royal Victoria Hospital. One hundred and one of these cases underwent surgical operations of *considerable* magnitude, the operative interference being 16 per cent. Eighteen of the 101 patients died, while eighty-three recovered completely from the operation, making an operative mortality of 17.8 per cent. Has the advent of insulin lowered this mortality? Dividing the cases into two groups, the first before insulin, and the second from the time insulin was available, (being used when necessary) we find:

Group I.—Number of operations		41
	Number of deaths	9
	Operative mortality	22%
Group II.—Number of operations		60
	Number of deaths	9
	Operative mortality	15%

From these data and from the experience of others it is evident that insulin has greatly lowered the operative mortality. Again, to-day we are attempting operative interference in poorer risks which would tend to raise the percentage, but even with this handicap it is falling rapidly.

There are three periods in the handling of a diabetic who undergoes a surgical operation; the preoperative, the operative, and the postoperative. Co-operation between the surgeon and the internist should be such that the dangers lurking will be prophylactically provided for. These are shock, acidosis, and infection. Unless the surgical aspect is that of an emergency the preoperative treatment should render the patient free from glycosuria and acidosis, and lower the blood sugar to a normal level. Insulin should be used when necessary. I think that it is wiser to maintain the patient upon a fairly liberal diet during this period employing the necessary insulin, rather than to lower the hyperglycæmia by fasting or green vegetable days. We must keep up the glycogen reserves. Wilder of the Mayo Clinic recommends that for the three days preceding the operation the diet should contain at least 100 grms. of carbohydrate. A fluid intake of from 2,000 to 3,000 cc. per day is important.

*A paper read before the Montreal Medico-Chirurgical Society, January, 1925.

On the day of operation usually no food is given. An injection of insulin varying with the case from five to fifteen units one half an hour before the anæsthetic enables the patient to burn the glucose thrown out from the glycogen depots associated with the operative procedure. This dose of insulin should be repeated a few hours after the operation if there is any glycosuria. The anæsthetic used is important. When possible, chloroform and ether should be avoided. Gas and oxygen, spinal, and local are those of choice. The unusually fine results obtained by the Mayo Clinic using ether anæsthesia with diabetics can possibly be explained by the light anæsthesia employed. In a two-year series of 327 operations from October, 1921, to October, 1923 on 251 diabetic patients, there were 141 major operations. Ether anæsthesia was used in 104 cases. The mortality by operation was only 1.2 per cent and that for the intra-peritoneal group was 3.6 per cent. In the 104 cases given ether the average consumption of ether was 1 oz. for 9 8-10 min. of operating time. Fitz found this to be only 46 per cent of the amount used in other large hospitals. We have avoided ether as much as possible.

Contrary to the opinion held in some other clinics I believe that it is best to maintain freedom from glycosuria during the post-operative period. Food in most cases can be started the day after the operation, handled by insulin if necessary, but hyperglycæmia should be avoided. Only with a sharp, severe acidosis is glucose administration, given in conjunction with insulin, advisable.

The diabetic of course is prone to all the surgical conditions of other individuals, and in addition is rendered especially liable to certain complications that frequently lead to an operation. Our operative group of one hundred and one patients shows this well:

TABLE I

DIABETES (SURGICAL OPERATIONS)

	No.	*Deaths*
1. Gangrene (amputation of leg)	19	6
2. Infections: Carbuncles	6	1
Abscess	16	4
3. Eye: Cataract	7	0
Enucleation	1	0
4. Herniotomy	10	0
5. Thyroidectomy	2	0
6. Cholecystectomy, Appendectomy, Panhysterectomy, Prostatectomy, Cæcostomy, Laparotomy, etc	20	7
7. Others	20	0
Total	101	18

Gangrene, infections, and cataract operations head the list. Our greatest mortality has been with gangrene.

If we divide this group into two parts, one before insulin, and one with insulin when necessary we find the following:

TABLE II

Before Insulin	*No.*	*Deaths*
1. Gangrene	10	3
2. Infections	10	4
3. Abdominal Operations	8	2
4. Others	13	0
Total	41	9

After Insulin	*No.*	*Deaths*
1. Gangrene	9	3
2. Infections	12	1
3. Abdominal operations	24	5
4. Others	15	0
Total	60	9

It would appear that to-day diabetics in our clinic die from gangrene requiring amputation in about the same percentage as before the days of insulin. A larger series may tell a different story. Wilder states that with insulin one can be more conservative in amputations. A few gangrenous toes have been reported healed. Several workers have obtained satisfactory results with amputation near the line of demarcation. I have never seen a gangrenous toe with or without insulin heal spontaneously and completely. In most of the cases where a conservative amputation has been attemped a secondary one higher up has been imperative at a later date.

The type of diabetic that develops gangrene is the mild chronic case with onset of diabetes late in life, cases poorly treated or not treated at all. Arterio-sclerosis with calcification as a rule precedes and is the underlying cause of the gangrene. This arterial change has a definite relation to the diabetic condition which we do not understand. The cause of death is usually infection secondary to delayed healing of the stump, which again is due to the impaired circulation. Can insulin be expected to improve the circulation?

A review of our two major groups, gangrene, and infections will not be out of place. Firstly, the gangrene group.

See Table III.—

The outstanding points in this group are:

1.—The advanced age—average being sixty-four years.

2.—Equal distribution between the sexes.

TABLE III

GANGRENE GROUP (AMPUTATION OF LEG) DIABETES MELLITUS

Name	*Age*	*Sex*	*Glycosuria gm.*	*Acidosis*	*Glucose Threshold %*	*Anæsthetic used*	*Result upon Discharge*		*Insulin*
							G=	*Total Calories*	
Before Insulin									
A1., 1918	68	F	130 (Diet Uncont)	trace	0.20	Spinal	Died	Failure to heal	Infection
Sp., 1919	60	F	75 "	CO_2=37	0.25	Spinal	88	800	
Sp., 1919	68	M	20	0	0.22	Spinal	120	2200	0
El., 1919	72	M	10	0	0.22	Gas and O_2	157	1600	0
Fe., 1918	45	M	5	0	0.20	Spinal	115	2200	0
Co., 1920	57	M	35	0	0.21	Gas and O_2	141	1500	0
Ro., 1920	64	M	35	trace	0.23	Spinal	118	1350	0
Jo., 1921	51	F	10	trace	0.24	Gas and O_2	110	1300	0
Ke., 1921	61	M	0	0	0.20	Gas and O_2	Died	Failure to heal	Infection
Ha., 1922	74	M	10	0	0.24	Local	100	1800	0
After Insulin									
Si., 1922	69	M	60 (Diet Uncont)	0	0.21	Gas and O_2	100	1600	20
Wa., 1923	74	F	10	CO_2=30	0.24	Spinal	113	1700	32
Cr., 1923	56	M	0	0	0.18	Spinal	222	2300	0
Tr., 1923	62	F	20	0	0.20	Spinal and Gas	Died	Failure to heal Septicæmia	Infection
Jo., 1924	54	F	128 (Diet Uncont)	0	0.24	Gas and O_2	92	1550	68
Pr., 1924	62	F	10	0	0.25	Gas and O_2	Died	Gangrene Stump	Infection
Pe., 1924	76	M	0	0	0.18	Spinal	102	1870	0
De., 1924	66	F	20	0	0.22	Spinal	Died	Broncho-pneumonia	
O'c., 1924	69	F	10	0	0.24	Gas and O_2	100	1500	30

G=CH0+0.58P+0.1F. (Figured from intake).

3.—Mildness of the diabetes—in all those cases where glycosuria was marked upon admission diet had been uncontrolled.

4.—Relative freedom from acidosis.

5.—Raised glucose threshold—due to arterial change in the kidneys.

6.—High carbohydrate tolerance upon discharge—another evidence of the mildness of the diabetes.

Deaths have the same cause to-day as before insulin, that is, failure to heal with resulting infection.

The second group, the infections, shows a definite improvement in results obtained with insulin. No cases with carbuncles have been lost. One death occurred among the abscess group; in a male, aged sixty-seven, who was admitted with an extensive pus infiltration of his thigh, streptococcus septicæmia, and severe acidosis, the CO_2 capacity being 21 vols. per cent. Such a case was practically hopeless.

Below are presented, in brief, tables showing the satisfactory course of four diabetics undergoing major operations.

Case I.—No. 260. Female. Age forty-eight. Admitted September 27, 1921. Diagnosis: diabetes mellitus with gangrene of the left foot, chronic nephritis, and extensive xanthoma diabeticorum. The diabetic symptoms dated back about five years while glycosuria was first found three years previously. The temperature was normal. There was moist gangrene of the foot.

See Table IV.—

Case II.—No. 281. Female. Age forty-eight. Admitted August 5, 1924. Diagnosis: Diabetes mellitus and exophthalmic goitre. Symptoms referable to hyper-function of the thyroid started in 1912. In May, 1916, she was admitted to the hospital the diagnosis being exophthalmic goitre. In March, 1918, a bilateral upper polar ligation was done. Apparently, she remained fairly well until June, 1924, when palpitation, nervousness, tremor, and loss of weight reappeared. A moderate degree of exophthalmos had been present from the onset in 1912. Admitted in a semi-delirious state. Pulse 160.

See Table V.—

Case III.—No. 714. Female. Age fifty-four Admitted February 26, 1924. Diagnosis: cancer of the cervix and diabetes mellitus. Dia-

TABLE IV

Date	Total Intake Glucose	Calories	Glycosuria	Blood Sugar Fasting	Insulin	Remarks
1921	gm.		gm.	%	units	
September 28	22	160	10	0.23	0	
October 1	0	0	0	0.13	0	Amputation left leg
" 24	108	1460	0	0.13	0	Discharged
1924						
May 3	70	900	128	0.47	40	Readmitted.
" 5	40	450	34	0.35	35	Amputation right leg.
" 7	44	560	5	0.28	30	
" 20	90	1360	0	0.18	62	
June 5	92	1550	0	0.15	68	Discharged.

Note.—No post-operative rise in temperature. Anæsthetic: gas and oxygen.

Note.—No post-operative rise in temperature. Anæsthetic: Gas and oxgyen
Total glucose intake derived from formula.
G=C.H.O.+0.58P+0.1F. (Woodyatt).

TABLE V

Date	Pulse	Total Intake Glucose	Calories	Glycosuria	Blood Sugar Fasting	Insulin	Basal	Lugol's Solution
1924		gm.		gm.	%	units	%	min.
August 6	160	23	350	23	0.45	50	—	45
" 9	110	58	813	23	0.26	30	—	30
" 12	72	58	825	0	0.18	25	+21	30
" 14	84	0	0	6	——	0	——	—
			Thyroidectomy—bilateral—subtotal					
" 24	75	0	1360	0	0.18	34	+12	—
September 20	86	0	1980	0	0.13	38	+4	30
								Discharged

Note.—Plasma CO_2 capacity: August 6—25 vols. %. August 9—50 vols. %. Patient was extremely toxic, and semi-delirious. Unable to obtain basal rate before operation. Pulse rate fell by crisis. Post-operatively the pulse remained below 90. Anæsthetic: gas and local.

TABLE VI

Date	Total Intake Glucose	Calories	Glycosuria	Blood Sugar Fasting	Insulin	Remarks
1924	gm.		gm.	%	units	
March 1	120	2000	0	0.15	16	
" 8	0	0	0	——	10	Panhysterectomy.
" 10	Fluids		7	0.29	10	
" 12	54	500	0	0.21	10	
" 17	90	1430	0	0.13	21	
April 14	117	2090	0	0.12	26	Discharged.

Note.—Anæsthetic: gas and ether for 1½ hours. Slight post-operative rise in temperature and pulse.

TABLE VII

Date	Total Intake Glucose	Calories	Glycosuria	Blood Sugar Fasting	Insulin	Remarks
1924	gm.		gm.	%		
February 4	105	1460	56	0.21	0	
" 7	52	740	3	0.15	0	
" 28	113	2160	0	0.13	26	
March 4	0	0	0	0.12	5	Appendectomy, colopexy.
" 6	0	0	12	0.23	15	
" 9	55	850	0	0.15	25	
" 16	92	1830	0	0.14	31	
" 26	110	2160	0	0.12	26	Discharged.

Note.—Practically no post-operative temperature rise.
Anæsthetic: gas, and oxygen and ether.

betic history began three years before. She was able to take food containing 2,000 calories when receiving twelve units of insulin per day.
See Table VI.—

Case IV.—No. 696. Male. Age fifty-four. Admitted February 2, 1924. Diagnosis: diabetes mellitus and chronic appendicitis. The diabetic history was of six months' standing. General condition was only fair.
See Table VII.—

It would appear that in the future one of the chief causes of death, if not the main one, in the care of diabetics will be gangrene. Owing to the altered structure being at fault, insulin cannot play the same life-saving part as it can in severe acidosis, coma, or infection. If we exclude gangrene as a complication the diabetic to-day, controlled by our best means, is one hundred per cent a better surgical risk than in pre-insulin days.

Now what can we do to prevent the onset of gangrene. Gangrene rarely develops in controlled cases of diabetes. In our series of 631 cases I have never seen it develop so long as the diabetes was under control. This would indicate the wisdom of not allowing diabetics past middle life to run glycosuria.

Whether or not the arterial change can be prevented by controlling the diabetic condition has not been proven. Is the diabetes in these cases a manifestation of the general arterial change, affecting the pancreas as well as the extremities? If such is the case a strict control of the diabetes could only hope to arrest the arterial change which one might fairly expect to be progressive.

It is an important observation that among the Japanese, where diabetes is common, gangrene is almost unknown. This fact would support the fact that the arterial change preceded the diabetes. But again it can be explained in part by the Japanese footwear. It tells us that our diabetics should wear properly fitting shoes, and give daily attention to the hygiene of their feet. When gangrene is prevented rather than cured the diabetics' surgical mortality rate will be cut in half.

GOITRE FROM THE MEDICAL STANDPOINT*

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TWO outstanding characteristics of goitre make a discussion of this disease of constant interest to physicians in this region. First, its endemic occurrence added to the fact that the basin of the Great Lakes is one of the great goitre regions of this country; and second, the fact that endemic goitre is one of the most preventable of diseases.

Owing to its endemic character and the unescapable evidence of its presence goitre was known and described long before the Christian era. It is surprising therefore, that no definite knowledge of the physiological function of the thyroid gland developed before 1874 when Sir William Gull published his clinical and pathological study, "On a Cretinoid State Supervening in Adult Life in Women." During the fifty years that have elapsed since then, great progress has been made in our knowledge of the physiology, pathology, and chemistry of the thyroid gland and particularly of the preventive treatment of endemic goitre. Notable advances have also been made in the surgical treatment of various pathological conditions of the gland. Among the many investigators and clinicians who have made valuable contributions to this knowledge may be mentioned in particular, Horsley, Murray, McKenzie, Simon, Kocher, Halsted, Crile; Marine, Kimball and Lenhart; DeQuervain, McCarrison, C. H. Mayo and his associates, Kendall and Plummer. Many other names, particularly on this continent, might well be added to this list.

As stated above, the basin of the Great Lakes is one of the important endemic goitre districts of America as are also the Cascade Mountain Re-

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gion of Oregon, Washington, and British Columbia. Of even greater importance than these are the goitre districts of the Alps and of the Himalayas, in the latter of which, according to McCarrison, it is difficult to find a man, woman or child who is not deformed by a goitre.

As Marine and Kimball[1] have stated, "the mildness or severity of the disease in a district may be determined by the incidence of myxœdema or cretinism—a fact known to Morel and expressed in his famous doctrine, 'goitre is the first halting place on the road to cretinism.' '(le goître est la première étape sur le chemin qui conduit au cretinisme).' "

Physiology of the Thyroid Gland.—The best résumé of our knowledge of the physiology of the thyroid is that recently given by Marine in the Eighth Mellon Lecture delivered before the Society for Biological Research, University of Pittsburgh, on May 10th, 1923[2]. He states that the major function of the thyroid is to provide through its iodine-containing hormone a means for the maintenance of a higher average rate of metabolism than would otherwise exist and for varying that rate in accordance with the changing needs of the organism. In animals the removal of the thyroid gland causes the metabolic rate to be lowered as much as forty per cent, this corresponding to the decrease seen in the severer cases of myxœdema in adults. Marine states that the fact that the thyroid provides a means for varying the heat production can be shown by the following facts: (1) injuries of the suprarenal glands are accompanied by an increase in heat production provided the thyroid gland is intact; if the thyroid has been removed there is little or no increase in heat production; (2) in rabbits during pregnancy there is increased heat production which is reduced or abolished by thyroidectomy; (3) administration of iodine or of thyroid gland causes a striking increase in heat production; and (4) removal of the thyroid gland causes a decrease in the basal metabolic rate.

In 1895 Bauman found that iodine was a normal constituent of the thyroid gland; in 1916, Kendall isolated the iodine-containing hormone in crystalline form and gave it the name of thyroxin, and Marine has shown that there is a direct relationship between the iodine content and the histological structure of the gland. According to Marine's observations, in glands of normal histological appearance, the iodine content varies between 5.5 mgm. and 1 mgm. per gram of dried gland; if this content falls below 0.1 per cent, hypertrophic and hyperplastic changes occur. He also found that after the removal of three-fourths of the thyroid gland, compensatory hyperplasia could be prevented in the remaining portion by the administration of from one to two mgm. of iodine weekly. Marine confirmed the observation of Halsted that puppies born from mothers from which most of the thyroid gland had been removed had enlarged thyroids; and he found further that these goitres could be prevented by the administration of iodine to the pregnant mothers. He found that in highly goitrous districts such as Cleveland where most dogs have hyperplasia, the development of goitre in puppies could be prevented by giving them 1 milligram of iodine weekly; while puppies which lived in the same kennels and ate the same food but did not receive the iodine developed thyroid hyperplasia. As will be noted later, these observations in animals are in accord with clinical experiences.

Diseases of the Thyroid.—From the clinical standpoint a simple classification of the diseases of the thyroid such as the following might be made:

(1) Thyroid insufficiencies—
  (a) Simple goitre—endemic, epidemic and sporadic.
  (b) Myxœdema—(1) Infantile (Cretinism); (2) Adult (Gull's Disease).
(2) Exophthalmic goitre.
(3) Adenoma of the thyroid, with or without hyperthyroidism.
(4) Tumours of the thyroid.
(5) Inflammation of the thyroid (thyroiditis).

Simple Goitre

Marine defines simple goitre as a compensatory or work hyperplasia of the thyroid gland which develops during the course of certain metabolic disturbances of unknown nature but is primarily dependent on a relative or absolute deficiency of iodine. A simple goitre may be present at birth, but as a rule it develops at the time of puberty or in women during the child-bearing period. It is present both in man and in animals in the goitrous districts.

Etiology.—Popular belief has always asso-

ciated the incidence of goitre with some deficiency in the constituents of a water supply, this impression probably dating from the interesting narrative of Forster, Captain Cook's surgeon in 1772. He states that the supply of water running low, the crew collected floating ice broken off from icebergs, and many of those who drank the water obtained from the melted ice developed goitre, while those who did not drink of this water were not so affected.

While the cause of simple goitre is not definitely known, it may be due to a lack of iodine intake, to imperfect absorption of iodine, or to an increased demand of the body for iodine such as is present during pregnancy, lactation or in certain infections. It is well known, too, that a diet rich in fat quickly exhausts the iodine store. In this connection the experiments of McCarrison in Northern India are of interest. This investigator filtered water through Berkfeld filters and gave the deposit by mouth to thirty-six men who were segregated in a military camp. Of these, ten developed goitres, and five showed transitory swelling of the thyroid. To a second group of thirty-one men he gave this same water after it had been boiled, and among them no cases of goitre developed. Further work along this line might throw some interesting light on the etiology of simple goitre.

Pathology.—When the iodine store of the thyroid falls below 0.1 per cent, there is increased vascularity of the gland with hypertrophy and hyperplasia of the cells. This enlargement may be uniform or sometimes the gland may be irregular and nodular as the result of the development of adenomata.

The characteristic pathological changes in the thyroid in simple goitre are, first, proliferation of the cells, the epithelial lining of the acini undergoing folding and plication. At the same time the vascularity and the fibrous stroma are increased. These changes are followed later by an increase in the colloid content and at the same time, a flattening of the columnar epithelium of the acini, so that it may become almost pavement in type. In the larger goitres of long duration there may be tissue alterations of the degenerative type due either to hæmorrhage or inflammation. As the result of the increased colloid content the gland may attain a large size.

Symptoms.—A simple goitre may attain a considerable size without producing any symptoms, the patient's attention being attracted to the increased size of the thyroid by the tightness of his collar. The larger goitres, however, may cause many symptoms as the result of pressure on the surrounding or underlying structures. Thus the trachea may be displaced or compressed with resultant dyspnœa, inspiratory stridor, and cough; the recurrent laryngeal nerve may be involved, with resultant hoarseness, or in severe cases, a paralysis of the vocal cord; or pressure on the vessels of the neck may cause their distension with resultant cyanosis and sometimes œdema of the face.

The most troublesome symptoms occur in those cases in which the goitre extends downwards into the superior mediastinum, and particularly in those cases in which coughing or deep breathing causes it to move downwards and upwards through the superior strait. Sometimes it may become incarcerated in the superior strait, the resultant compression of the trachea causing symptoms of acute suffocation. In one of my cases of intrathoracic goitre, there was complete obstruction of the superior vena cava with swelling and cyanosis of the face, and at times of the arms, and with huge dilated veins over the chest, shoulders, abdomen and in the axillæ.

The differential diagnosis of intrathoracic goitre presents some very interesting problems. Since intrathoracic goitres, with the exception of those that develop from accessory thyroid glands in the mediastinum, usually arise from the right or left lateral lobe of the thyroid, the trachea is displaced to one side and may be so compressed as to have the shape of a sabre sheath. On fluoroscopic examination of the chest it may be difficult to differentiate an intrathoracic goitre from a neoplasm or an aneurysm, or enlarged glands of Hodgkin's disease, or leukæmia. A goitre, however, moves upwards with the trachea on swallowing, while the tumour or an aneurysm does not. There is a distinct angle between the shadow of the aorta and that of an intrathoracic goitre and this angle changes during deglutition, deep inspiration and coughing. The shadow of an intrathoracic goitre broadens out to become continuous with the shadow in the neck; and the outline of a goitre is regular except in those cases in which it is nodular or malignant in character.

Treatment.—Simple goitre is a preventable

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disease. Although different forms of iodine had long been empirically used in the treatment of goitre, it was not until 1910 that it was used on a large scale in preventive work. At that time the presence of enlarged thyroids in the fish hatcheries in Pennsylvania had become so serious that the abandoning of the industry was under consideration but Marine and Lenhart, in collaboration with the Pennsylvania State Fish and Game Commission, succeeded in preventing the incidence of goitre in the brook trout in these hatcheries by adding iodine to the water in concentrations not greater than 1:1,000,000. A little later Marine began the administration of small doses of iodine by mouth for the prevention and treatment of simple goitre in patients in the Dispensary at Lakeside Hospital. The first extensive demonstration of the value of iodine in the prevention of goitre, however, was that of Marine and Kimball among the school children of Akron during the period from 1916 to 1919. During these three years they administered 2 gm. of sodium iodide each spring and autumn to school girls from the fifth to the twelfth grades. Among 2,190 pupils who took the treatment, only five developed thyroid enlargements, while among 2,305 who did not take the iodide, 495 developed goitres.

Throughout the endemic goitre districts the preventive treatment of goitre should be administered routinely in schools and by physicians in private practice, to all children between the ages of seven and fifteen. My own practice is to give 10 milligrams of iodine in chocolate tablets daily for a period of two weeks every three months. Some advise the administration of a tablet containing 10 milligrams of iodine once a week throughout the period mentioned above. Iodine may also be given in the form of syrup of iodide of iron or as the syrup of hydriodic acid. Recently a law has been passed in some states making it compulsory for salt dealers to add a certain percentage of iodine to common table salt so as to ensure that each individual will get a certain amount of iodine with his food. There is a certain element of danger in this, however, as the amount of iodine received by the individual will vary according to the amount of salt that is taken, and I have seen cases of adenoma of the thyroid in which symptoms of hyperthyroidism developed after the use of iodized table salt. This danger has been emphasized by Duncan Graham.

In pregnancy, particularly during the latter months, iodine in small doses should be given to the mother to prevent the development of goitre in the new-born child. This is now done as a routine by many of our obstetricians, and the importance of the use of iodine should be particularly emphasized in those cases in which pregnancy follows a thyroidectomy. I have seen large goitres in new-born children in cases in which the precaution of giving iodine to the mothers had not been observed.

Myxoedema

Myxœdema is the result of lack of function of the thyroid gland. It is characterized by striking changes in the general metabolism of the body with functional alterations in the skin and its appendages, in the subcutaneous tissues and in the central nervous system. Two forms may be described: (1) A primary form associated with fibrosis and atrophy of the thyroid gland; and (2) a secondary form following thyroidectomy (cachexia strumipriva). When it occurs early in life it is known as cretinism or infantile myxœdema.

Cretinism.—Cretinism is a chronic disease which develops in early childhood and is associated with imperfect development of the body and with imbecility. As stated above, it is most common in those districts in which goitre is prevalent. About sixty-five per cent of the cases of cretinism are of the female sex. As a rule the thyroid can not be felt. If it is present and enlarged, it is fibrosed and functionless. Milder grades of thyroid insufficiency are sometimes seen in young children associated with an eczematous condition of the skin.

Adult Myxoedema.—The adult type of myxœdema, whether primary or secondary, presents such a characteristic clinical picture, that it has been amazing to me to see how frequently the diagnosis is overlooked. The most important symptoms of which these patients complain are abnormal sensitiveness to cold, dryness of the skin, mental apathy, loss of hair, gain in weight, thickness of the tongue with resultant change in the voice, and a change of expression so marked that these individuals dislike to mingle with their acquaintances because of the attention

that is provoked. Not infrequently auditory and visual hallucinations are present also.

The most characteristic physical signs are dryness of the skin; solid œdema of the subcutaneous tissue which does not pit on pressure; a swollen, expressionless face, swelling of the ears and thickness of the lips; enlarged tongue and an excess of saliva. Fat pads are present above the clavicle and the hands are spade-like. There is a scantiness of hair on the head and on the body. As a rule the thyroid can not be felt; if enlarged it is functionless. In severe cases cardiovascular renal changes are often present. The temperature is subnormal, often as low as 95 or even 93 degrees F. and the basal metabolic rate varies from twenty to forty per cent below normal. Secondary anæmia is commonly present. Since the diagnosis of myxœdema is usually overlooked, the differential diagnosis from the conditions with which it is most commonly confused should be carefully considered. These conditions include pernicious anæmia, chronic nephritis, acromegaly, hypopituitarism (Fröhlich's syndrome), and psychoneuroses associated with depressed conditions.

Exophthalmic Goitre.—The symptoms and physical signs of exophthalmic goitre are so well known, and so characteristic that they are readily recognized. Exophthalmic goitre is prevalent wherever there is a high incidence of simple goitre. An acute development of the symptoms of hyperthyroidism may be brought on by infection, by pregnancy, or by a severe nervous shock.

While hyperthyroidism should be strongly suspected in any case in which, without signs of cardiac disease or fever, there is constantly a pulse rate above 100, it is important to bear in mind the importance of differentiating milder cases of hyperthyroidism from neurasthenia or from neuro-circulatory asthenia.

Patients with *neurasthenia* do not show the fatigability that is characteristic of hyperthyroidism. Moreover, in neurasthenia the tachycardia and tremor vary greatly during the day and usually disappear when the patient is at rest. This is not the case in hyperthyroidism. The ocular signs are absent in neurasthenia, while in this condition the patient will give a history of various phobias — claustrophobia, agoraphobia, etc. If the neurasthenic patient happens to have a simple goitre, the difficulty of differentiation is increased. The estimation of the basal metabolic rate by a competent person is of great value and should be repeated several times. The presence of a basal metabolic rate which is persistently above plus fifteen favours the diagnosis of hyperthyroidism. The Goetsch test is not a reliable method for differentiating between neurasthenia and hyperthroidism.

In army training camps during the Great War great difficulty was experienced in distinguishing between cases of *neuro-circulatory asthenia* (irritable heart) and hyperthyroidism. These patients had a tachycardia on the slightest exertion. If a careful history was taken it was found that as children they were delicate and undernourished; as they grew older they were unable to take part in games requiring severe exertion and when they came to choose a life occupation they selected one requiring a sedentary life.

Basal metabolism estimations, however, showed a normal rate, thus indicating the true diagnosis. When these individuals came from an endemic goitre district and had enlarged thyroids, the difficulty of differentiation was increased. In cases of neuro-circulatory asthenia, however, ocular signs are absent.

Treatment of Exophthalmic Goitre.—Three forms of treatment of exophthalmic goitre require consideration:—(1) *Medical treatment* (2) *Roentgen-ray treatment;* (3) *Surgical treatment.* Each of these forms of treatment has for its object the reduction of the basal metabolic rate. The medical treatment, the principal factor of which is rest, seeks to attain this objective by a reduction of the physiological demands of the organism; while the other two forms of treatment attempt to accomplish the same end by reducing the amount of functioning gland tissue. A certain proportion of cases will be cured by medical treatment alone but the recovery is often temporary so that surgery offers the best guarantee of a permanent cure.

Medical treatments.—As stated above, rest is the most important factor in the medical treatment of exophthalmic goitre. Adequate rest for these cases must include mental repose as well as physical inactivity and necessitates, therefore, the securing of an environment in which the patient can be free from care and petty worries. The nervous restlessness may be

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overcome by gentle massage, baths, hot or cold packs and alcohol rubs. The diet should be sufficiently liberal to meet the basal metabolic requirements of the individual. In many cases 3,500 calories daily are required. Coffee and other stimulants should be avoided and the amount of meat should be restricted. It may be necessary to give bromides, luminal or other sedatives in order that the patient may secure the much needed sleep. Occasionally morphine may be required. If the patient vomits frequently it may be necessary to supply the need of the tissues for water by the Murphy drop or by hypodermoclysis. If the heart is irregular and rapid and if there are signs of decompensation digitalis in full dosage should be given. Usually after the patient has rested for a period of three weeks the heart action will be slower and the basal metabolism will be decreased from 15 to 20 per cent.

In 1910 Marine and Lenhart showed that small doses of iodine would reduce the basal metabolism and that therefore the administration of iodine to patients with exophthalmic goitre was a valuable preoperative measure. Recently Plummer has advised the preoperative administration of 5 to 10 drops of Lugol's solution in these cases. If the patient is very toxic he advises giving as large a quantity as 100 drops during the first day. According to my own experience in the cases of true exophthalmic goitre the effect of Lugol's solution is usually seen on the fourth or fifth day when the patient will show a definite slowing of the pulse rate and a drop in the basal metabolism so that he is by so much the better prepared for operation. The improvement produced by Lugol's solution is not likely to be lasting and should only be considered as a useful factor in the preparation of the patient for operation.

The Roentgen-ray treatment may give beneficial results, though they are not as lasting as the results secured by surgery. Means and Aub[3], maintain on the basis of their experience that the use of the Roentgen-ray in the treatment of exophthalmic goitre is as effective and less dangerous than surgery, and believe that surgery should be used only after x-ray and other methods have failed. The experience at the Mayo Clinic on the other hand is that at the best, treatment with the Roentgen-ray results in but temporary improvement[4].

Lack of space prevents a discussion of adenomata and of benign and malignant tumours of the thyroid. A paragraph regarding inflammation of the thyroid may, however, be added.

Inflammation of the Thyroid

Thyroiditis.—The thyroid gland, in common with any other gland or tissue of the body, is liable to invasion during the course of any acute or chronic infectious disease. Thus it may occur during the course of typhoid fever or of influenza or it may result from a general tuberculous or syphilitic infection. In acute cases of thyroiditis, the onset, like the onset of a localized infection elsewhere, is ushered in by chills and fever and by intense local pain. The pain in the neck may be referred to the ear or to the shoulder and arm and there may be a sense of constriction in the neck with difficulty in breathing. The gland soon becomes swollen, hot and tender to the touch and there may be accompanying inflammation of the trachea with hoarseness on talking. If suppuration occurs there is redness of the skin over the thyroid. In some cases there may be alarming attacks of suffocation.

A form of thyroiditis called "woody thyroiditis" was described by Riedel in 1876. This is of very rare occurrence. The gland, as indicated by the term "woody" is hard and firm, somewhat resembling a malignant tumour. The most striking symptoms are pain and dyspnoea. This condition may cause all the symptoms that are present in any other form of enlargement of the thyroid.

Treatment.—The treatment of acute thyroiditis is like that of any acute localized inflammatory condition. Incision for the evacuation of pus should be made if there is evidence of suppuration.

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THE SURGICAL MANAGEMENT OF GOITRE

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NO other branch of surgery has made the advance during the last twenty years as has the surgery of the thyroid gland. The more recent graduates are entering practice with a much greater realization of the value of surgery early in hyperthyroidism; but in spite of this advance too many patients appeal to surgery at a time when the risks of operation are considerable. Goitre patients do not as a rule ask for surgical relief for cosmetic reasons. It is either for the relief of tracheal or œsophageal pressure, or toxic symptoms plus their end results. It must, however, be emphasized that many patients come to their physician complaining of weakness and excessive fatigue without any idea that an adenoma, which has been present in the thyroid unchanged for many years, is the basal cause of their disability. Unfortunately too often the physician accepts their diagnosis, and as a result of incomplete examination does not recognize for many months that the ordinary tonic treatment will not produce the desired results.

If the risks, death-rate, and general economic inefficiency from goitre are to be reduced it becomes imperative to outline definitely the clinical syndrome and management of patients suffering from thyroid disease. One must definitely recognize that certain types of thyroid disease will respond solely to medicinal and dietetic control, with a suitable environment. A fairly large percentage of this group may require in addition surgical measures. This applies more particularly to the diffuse hyperplastic gland, producing the so-called exophthalmic syndrome. The thyroid enlargements of another group are not in the slightest degree benefited by any management except surgical removal. This group we feel comprises the adenomata with toxic symptoms. The diffuse colloid goitre give variable results from medicinal therapy, some improving on iodine, others on thyroid extract, while others are unchanged; but when they become so large despite the above treatment that they induce pressure symptoms, surgical treatment is indicated.

If the patient presents the type of disease requiring surgical therapy, I know of no situation in which it is more important to inspire confidence and co-operation between patient and medical adviser. It is an excellent plan after the examination has been completed to mention quickly and briefly the types of goitre, and indicate the plan applicable to the patient's particular type. In this way there is established a frank candidness between doctor and patient, thus minimizing mental fear, because the patient realizes that nothing unexpected is likely to be done. It is extremely important to have the patient appreciate that undue haste is disastrous, to have him realize that the time spent in pre-operative preparation and investigation, while postponing the actual operative procedure itself, adds greatly to its safety; and because of this will more often shorten than lengthen the total convalescence. It thus becomes important that the patient realizes the operation is not the end of treatment, but merely the beginning of final convalescence. They must be made to appreciate that an improperly controlled convalescence may completely nullify an otherwise perfect surgical procedure.

A practical classification of goitre from the standpoint of symptomology and pathology is as follows:*

I Diffuse
- (a) Adolescent goitre
- (b) Diffuse colloid
- (c) Diffuse hyperplastic (exophthalmic)

II Nodular
- (a) Colloid adenoma
- (b) Hyperplastic adenoma

III New Growths.

Palpation of the thyroid decides whether or not it is diffuse or nodular. The history and

*Starr, Graham, and Robinson, *C.M.A.J.*, 1920, vol. x, No. 11.

physical examination of the patient decide whether the goitre is toxic or non-toxic. At this point I would like to state that if the case is one of toxic goitre the size is no criterion as to the severity of the toxæmia. A toxic adenoma may be difficult to palpate, and a thyroid diffusely hyperplastic may feel almost normal. The symptoms of thyrotoxicosis on which one should rely are weakness, loss of weight and strength, nervousness, tremor of the fingers, weakness of the quadriceps and ability to stand the cold well.

If thyrotoxic symptoms are present it is well to do a basal metabolism test. This is as a rule best carried out in hospital. It is a good plan to have this test done within forty-eight hours after admission, for delay provokes restlessness on the part of the patient. The basal metabolic rate only assumes its true value when carefully correlated with other symptoms. No doubt a high basal metabolic rate means a marked degree of hyperplasia but is not a definite indication of the operative risk.

It has been wisely stated in other branches of surgery that it is a wise man who knows when to quit. In thyroid surgery it is a wise man who knows when to operate and how much to do. Judgment gained from experience is invaluable, but a clinical division of the cases helps materially. It is important to remember that toxic adenomata always carry more operative risk than diffuse hyperplastic goitre. The following grouping refers only to thyrotoxic cases. The colloid goitres do not require the same care and consideration.

Group I.
- (a) Duration of symptoms not over two years
- (b) No history of cardiac irregularity or decompensation
- (c) Basal metabolism from 100 to 135.

Group II.
- (a) Duration of symptoms not over two years
- (b) No history of cardiac irregularity or decompensation
- (c) Basal metabolism from 135 up.

Group III.
- (a) Duration many years
- (b) Auricular fibrillation or heart muscle insufficiency
- (c) Basal metabolism from 100 to 135.

Group IV.
- (a) Many years duration
- (b) Auricular fibrillation or heart muscle failure
- (c) Basal metabolism 135 up.

Group I., with a few days in hospital, are as a general rule fit for operation. During these few days they are subjected to some pre-operative treatment. Groups II., III., and IV. must be prepared over a period of time ranging from a few weeks to two or three months or longer. They must be brought to the status of Group I. as nearly as possible, but their operative risk will always be greater, and their postoperative efficiency will always be lower. If one can take a patient of Group IV. and fit him for operation, and in a year's time have a seventy-five per cent. efficient individual, as much as should be expected has been accomplished.

The problem arises as to how these bad risk patients may be improved. That depends on whether the risk is due to excessive toxæmia or heart damage, or both. The bad risk cases due to cardiac damage are of two types. First, those with auricular fibrillation, and second, those with heart failure with œdema, enlarged liver, and bronchitis. Digitalis and the proper balance of intake of solids and fluids if œdema is present, are the means at our disposal. With regard to the administration of digitalis, I have just this to say, that the patient should be brought under its pharmacological influence as quickly as possible, that is, with sufficiently large doses until the desired effect is noted, and then a sufficiency to maintain the result. The quantity of tincture of digitalis (B.P.) required to digitalize a patient is 1 cc. for each ten pounds of body weight. Where we have auricular fibrillation and signs of decompensation, we usually order 15 minims of the concentrated tincture (which is four times the strength of the B.P. tincture) every four hours until the heart becomes regular, which as a rule is after five or six doses. It is understood that the patient is under close supervision, and if signs of coupling of the beats arise, this should be discontinued for from twenty-four to forty-eight hours, and after that 5 minims administered once daily. If the drug is not borne well by oral administration, it may be given per rectum, using 1 drachm daily for two or three days in succession. It is also well to bear

in mind that the administration of iodine given to reduce thyrotoxicosis may act favourably on a heart with auricular fibrillation. In a few cases where patients have come into hospital with extreme nervous symptoms, elevation of temperature and marked complete cardiac irregularity, we have found that the administration of Lugol's solution has not only reduced the symptoms of thyroid hyperactivity but has had a very marked influence in regulating the heart action. The auricular fibrillation of thyroid disease is as a rule completely relieved following thyroidectomy.

The bad risks due to toxæmia, or toxæmia with some cardiac decompensation, are not as a rule so readily converted into good ones. The first great measure of course is rest, which must be absolute, and the second, which is of equal importance, is the administration of an abundance of fluids, preferably water. The only indication for omitting fluids is œdema, but should the patient be one with good cardiac compensation but with a high metabolic rate and other signs of high grade toxæmia, the intake of water should be from eighty to one hundred ounces a day. This amount overcomes dehydration, flushes the tissues and kidneys and hastens elimination.

The next measure which we possess to assist these patients into a quiescent period, is iodine, best administered in the form of Lugol's solution. A thorough understanding of the rôle of iodine administration in goitre is as yet lacking. It would appear to be an uncertain and at times dangerous remedy in toxic adenomata. In fact it is doubtful if iodine should ever be given to any case of adenomata, toxic or non-toxic, unless the patient be under strict observation. A non-toxic adenoma can readily be activated by the careless use of iodine. However, in diffuse hyperplasia we appear to possess a very potent remedy in this drug. If the patient is markedly thyrotoxic and unfit for operation, and iodine is used to improve the general condition, the usual procedure is to administer 10 minims of Lugol's solution once daily for a week or ten days. If the drug is acting favourably there will be marked improvement in the patient's general nervous condition and in the pulse and temperature readings. If operation is carried out at this time it is well to continue the administration of the iodine for two or three days following. The amount given after operation, particularly if the patient is showing signs of marked reaction, is much greater than that preceding operation. Ten minims of the Lugol's solution may be given by mouth every half hour for three doses and the series repeated in four or five hours. If the patient is vomiting and oral administration impossible, the solution may be given per rectum in drachm doses, to be repeated every twelve hours for three or four doses. Some surgeons advise larger dosage of Lugol's solution than I have here indicated.

While iodine has added greatly to the improvement of certain of these cases, yet ligation of the superior thyroid vessels is a still more important measure of preparing these cases for the more radical procedure. Ligation of the vessels and nerves of the superior pole of the gland is easily accomplished under local anæsthesia. Two things are thereby accomplished. First, the direct influence of blood starvation of a portion of the thyroid, and in addition a definite barrier to the influx of thyroxin into the venous circulation; and secondly, a factor, which I believe is of the utmost importance, is that it furnishes us with an index to the patient's reaction to operative procedure. This latter is the only reason for ligating cases with toxic adenomata. These thyrotoxic individuals are so susceptible to external stimuli and emotional upsets, that getting them used to operation helps them materially. An interval of three or four days is allowed between the ligations of the two sides. Following a single or bilateral ligation a patient may improve sufficiently in the course of a week or ten days to enable us to proceed with thyroidectomy, but as a rule that patient is sent home and to bed for two months to get the maximum of improvement.

We now come to the point where the patient is ready for thyroidectomy. Of the actual operative technique I wish to say only a few things. To operate on goitres successfully one must combine gentleness with speed, and in toxic goitres team work is all important. The assistant should have a knowledge of thyroid operative technique almost equal to that of the operator. The team mentioned above includes the anæsthetist. The responsibility for bringing the patient to the operating-table rests

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with the surgeon, but when once anæsthetized the anæsthetist assumes full responsibility as to how far the operation may be carried. The operative technique should be so planned that at any point the operation may be stopped and the skin flap closed if the anæsthetist advises that its continuance is unsafe. This method adds very greatly to the safety, and does not in the slightest influence the cosmetic result. In three or four days the skin flap can be reopened and the operation completed.

For the great bulk of goitre work nitrous oxide and oxygen anæsthesia administered by an expert is ideal. There are I believe a group of cases where heart damage is paramount, in which a combination of local anæsthesia and gas analgæsia is preferable. Local anæsthesia may be used alone, but the operator is prevented from doing the operation as speedily and patients very frequently state after operation that if the whole thing was to be done over again they would prefer to be asleep. In this way they are unconscious of the tugging which cannot be wholly prevented when working under local anæsthesia alone, and in addition they are saved from the mental agony of the operating-room.

In order to minimize the scar Michell clips, which are removed on the third day, are indispensable, and drainage should be from the angles of the wound and not from the centre, thereby avoiding tracheal adhesions which are a troublesome sequel in some cases following midline drainage.

Preceding all goitre operations, the patients are given a sedative hypodermically. Morphine grs. 1/4, and hyoscine hydrobromide grs. 1/200 are given one hour before, and morphia grs. 1/8 and hyoscine hydrobromide grs. 1/400 half an hour before operation. When the patient comes to the operating-room, he should be in a state of semi-sleep and indifference.

The post-operative care of goitre patients varies with the reaction to operation. The nontoxic and mildly toxic cases require very little out of the ordinary. If the patient shows signs of marked reaction as is indicated by rapid heart action, restlessness, and vomiting, he should be surrounded with ice-bags, kept well under the influence of morphia, and fluids pushed as indicated previously. The fluid may be administered by mouth or interstitially, or per rectum. The value of iodine and its method of administration during this period of reaction has been previously mentioned. One hundred grains of sodium bromide per rectum is an excellent sedative, given for one dose only. Troublesome cough is controlled by steam inhalation and the frequent use of an oil spray to the pharynx and larynx. A sedative expectorant of wine of antimony minims 10 with syrup of codeia drachms 1 q.4.h. is useful in allaying tracheal irritation. Nausea and vomiting following thyroid operations, if due to toxæmia, is of serious import. The administration of sodium bromide per rectum has distinct value. By mouth I have found that the administration of acid hydrochloric dil. minims 15, in a drachm of elix. lacto. pep., every two or three hours until the vomiting ceases is a most efficient remedy.

The facts that I wish to emphasize in this paper are the following. First, that adenomata of the thyroid are always surgical; second, that patients should not be left to suffer with the toxæmia of goitre until cardiac degeneration is present; third, that if medical treatment is not giving results in cases of diffuse hyperplasia, surgery should be resorted to before the risks are insurmountable; fourth, that preoperative preparation, and to know when to operate are most important; fifth, an operative team with the anæsthetist responsible for the continuance of the operation is absolutely essential.

ACCORDING to recent statistics, the total French losses in the war amounted to 1,325,000 dead and missing. Of these 674,700 were killed in battle, 250,000 died of wounds, 175,000 of diseases, and 225,000 were missing; 9,287,822 were admitted to hospital, of whom 3,594,889 were wounded and 4,988,213 were suffering from various diseases. The proportion of killed and wounded was one in four. About one-fifth of the wounded had more than one wound. After 1916 about 80 per cent. of the wounded could be sent back to the front.

A CONSIDERATION OF THE ÆTIOLOGY OF RHEUMATIC ENDOCARDITIS

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THE heart has had a very special interest for physicians from the time the Egyptians portrayed the weighing of it in the presence of Osiris, up to the present. During the past fifteen or twenty years that interest has been intensified by the work of Mackenzie and Lewis and by their studies in the irregularity and in the mysteries of the intrinsic mechanism of the heart. These studies which have to do to a very large extent with the after results of acute disease do not apply so markedly to children where we are dealing either with the acute disease or the results of acute disease before time has brought about the changes so frequently seen in the adult heart. It is at this time that one would naturally hope to prevent the development of a great number of the pathological heart conditions met with in adult life.

In seeking to prevent one would logically first seek for the cause. Up to the present, except for the fact that acquired heart disease in children is practically always associated with rheumatism or chorea, there is no uniform agreement as to what the actual cause is. It is however, pretty generally agreed that these two diseases are due to a common or at least a closely associated cause and from the nature of their course that this is an infection. One must, however, recognize the fact that in the absence of tonsillitis, endocarditis, or other complications, uncomplicated cases of chorea will run throughout their entire course without the temperature ever going above the normal line or showing a wide diurnal variation. In this connection it can be further stated that when uncomplicated the very earliest manifestations of rheumatism such as growing pains or headaches in children are frequently, and I think one might also say usually, unassociated with fever. True, it is not essential that one must always have fever as a sign of an infection but if we are dealing with the same type of infection, why do we get fever at one time and not at another? Is it possible that in those very early cases of rheumatism and in chorea we have a soluble toxin acting upon a poorly resistant system and one in which no infecting organism has actually passed the lymphatic barriers into the body proper, and that it is only when this occurs that we get endocarditis or signs in the joints and the characteristic temperature of the infection. Or again, is it that the essential organism producing rheumatism and chorea is of a very mild pathogenicity and that it is only when other organisms gain entrance with it that we get very active signs? Or yet again, are there several closely related strains of organisms producing these different clinical signs?

As to what the actual infecting organism is, there is no uniform agreement. Dr. Reginald Miller in a recent paper asks if the time has not arrived when we can agree that the infecting organism is an alimentary streptococcus and says that for his own part he regards this as well proven. I have not been able to find that others accept it as so. Dr. Kenneth G. Stone of the pathological department of St. Bartholomew's Hospital in an article describing a complement fixation test for identifying streptococcal infections, which appeared in the December, 1923, number of the *British Journal of Experimental Pathology*, sums up by saying, "The question of the rôle of streptococci in the ætiology of rheumatic fever remains unanswered. The view has been repeatedly expressed that rheumatic fever is a specific bacterial infection and that the organism is a streptococcus of the non-hæmolytic group. It is hoped that further evidence as to the pathogenic significance of streptococci isolated from various organs and body fluids in cases of rheumatic fever and chorea may be obtained by applying the complement fixation test for the determination of specific antibodies in the patient's serum." By many the infection is thought to

be a filterable virus. One could quote others who have spent time investigating the various claims regarding the cause of rheumatic fever and who now state that quite candidly they do not know what the nature of the infection is.

There are, however, certain clinical facts regarding these diseases with which we are all more or less familiar and which may be of considerable value in eventually arriving at a more perfect knowledge of these diseases and their cause. Of these the rôle which the tonsil plays in the cases in which the symptoms manifest themselves as rheumatism and endocarditis seems to be paramount. If we get these cases as potential ones, and as it sometimes appears to me before the organism has actually passed the barriers into the general system, it is a rarity to have an endocarditis develop. During the past two and a half years in the cardiac clinic of the Hospital for Sick Children, in Toronto we have not had one develop. In cases which have had an endocarditis the clearing out of this source of infection seems to have had rather a remarkable bearing on reinfections. Six months ago, in reviewing 217 cases which were admitted to hospital during the past five years before strict removal of tonsils and adenoids for these cases was rigidly carried out, I found fifty-six cases which had been readmitted with heart involvement and many of these had had as many as four or five readmissions, some having a reinfection every year or oftener. In many of these cases one notes in my lists "no reinfection since tags removed or since tonsils and adenoids removed two or three years ago." At that time, out of over one hundred cases attending the cardiac clinic for two years, we had four in which chorea had recurred following the complete removal of all foci of infection so far as we could find them. One case in which chorea and rheumatic pains recurred and three cases in which rheumatic pains recurred. In none of these eight cases did we think that they had a reinfection of the heart. We had one case with an old adhesive pericarditis and a huge heart who had done unbelievably well and had become fat, robust and strong. The work of a large family was suddenly thrown upon her shoulders, she was admitted to hospital with a failing heart and broken compensation and died. Since we think that in children practically all of these cases of broken compensation are reinfections there seems little doubt that this child had gotten a reinfection although the tonsils and adenoids had been cleanly removed. Since these results were compiled we have had three other cases readmitted and one case who was not admitted, but all had reinfections and the tonsils had been previously quite cleanly removed. One of these cases had belonged to that subacute type which seems clinically closely associated with chorea showing many rheumatic nodules and little recrudescences in fever every few weeks and an almost continuously rapid pulse. His heart had been found quite severely damaged on his discharge from hospital previous to his readmission although it was not comparable in size to the other four cases all of whom had the very large hearts which follow very extensive damage and pericarditis. During February of this year I tried to get all the cases of endocarditis back to the clinic. The weather was bad and all did not come. However, we have been able to follow most of them and so far as reinfections are concerned I think the numbers mentioned above are accurate. Of fifty-two cases of undoubtedly acquired endocarditis who have been under observation some time and who visited the clinic during February, none have had reinfections and all are doing remarkably well since complete removal of tonsils and adenoids. I think that there can be no doubt that as a preventive measure in potential cases and in cases in which the heart has not been too extensively damaged, we have an exceeding valuable weapon against rheumatic endocarditis or second attacks of it in complete removal of tonsils and adenoids. In chorea and in cases in which the heart has been very extensively damaged this is not a certain prevention of further trouble. In trying to make a survey of our clinical data this is a fact which we will have to consider. Is it that in these badly damaged hearts the infection has been encapsuled in the tissues much as a tuberculous focus which has become walled off and then lights up due to some lowering of resistance of the general system, or is it a reinfection from lymphoid tissue elsewhere such as the naso-pharynx or the bowel? It is possible that they may have obtained their reinfection from lateral bands of lymphoid tissue in the pharynx which it is almost impossible to re-

move and which one has noticed at times with an acute infection in the pharynx to show small white areas of necrosis in its follicles looking clinically just like an acute follicular tonsillitis. Or again it is always possible that the reinfection may have occurred through the lymphoid tissue in Peyer's patches, and it might be expected that if the slightest infection did enter the system it would be much more likely to settle upon these extensively damaged hearts.

Family History.—Before leaving the tonsil and its bearing upon endocarditis one should mention the family history and the apparent tendency throughout a great many of these families to tonsillar trouble and infections therefrom. Out of the fifty-two cases mentioned above, there were two cases in which the family history was unknown and five in which I could not get a history of any such tendency in the family, but in forty-five cases there was a definite history of diseased tonsils, rheumatism or heart trouble on either the father or mother's side, or both, or diseased tonsils and troubles therefrom in brothers or sisters of the patient. It would appear from these figures that certain families are more susceptible to these infections than others.

Family History of Rheumatism, Diseased Tonsils or Heart Trouble

Total cases	52
Maternal side cases	18
Paternal side cases	11
On both maternal and paternal side cases	5
History among brothers and sisters cases	29
No history cases	7
Percentage of cases showing family history of above	87.7%

Hygienic Surroundings. — Another factor which looms large in these cases is that of hygienic surroundings. Rheumatism and endocarditis is largely a disease of the hospital (public ward) classes. It is uncommon among the classes who live under the best and most comfortable circumstances. In the fifty-two cases just studied I could get no satisfactory history of the housing conditions in three cases. In twenty-eight cases there was a definite history of living in houses which were damp or had damp cellars previous to the onset of endocarditis. In ten cases they maintained that the house was dry but that the district was low lying and not good, in three the house was dry and not in a low lying district but cold and draughty, and in eight cases only were the housing conditions fairly good and not in a low lying district. In one of these the rheumatism came on after the child was debilitated following attacks of scarlet fever and diphtheria, the one following almost immediately after the other and in one case the father stated that the boy was always getting his feet wet. This leaves a very small number of cases in which we would call the housing conditions fairly good and even in those cases if the more fortunate classes of society had to live under similar conditions they would scarcely feel that they were living under good hygienic surroundings. Also I fear that in many of these cases food of the best quality and in sufficient quantity was not always available.

Hygienic Surroundings Previous to Onset of Endocarditis

Total cases	52
Housing conditions—Fairly good and not in low lying districts	8
House damp or cellar damp	28
House dry but low lying district	10
House dry and not in low lying district but cold and draughty	3
History of housing conditions previous to onset of endocarditis not obtainable	3
Percentage of cases in which hygienic surroundings might be classified as bad	80%

The Action of Salicylates.—Here again we have a factor over which there has been a great deal of controversy; certainly some of the results are not easy to explain. Why for instance, if rheumatism and chorea are due to a specific infection and the same infection, do we get such striking results in acute inflammatory rheumatism and such negative results in chorea? Dr. Miller's suggested explanation of the action of salicylates which he believes have a specific bactericidal action on the infection, is interesting and I should like to repeat it to you. He suggests that in rheumatism we have three sets of tissue changes set up. First, focal interstitial inflammatory lesions, the direct re-

sult of the infecting organism. These are the chief changes seen in acute arthritis, acute tonsillitis and in acute pericarditis when it exists without much myocardial damage. He says these are all well controlled by salicylates. Second, toxic parenchymatous changes often affecting the "noble tissues" of the heart muscle and brain. No bactericidal drug could here do more than prevent further damage by putting an end to infection. Therefore in this class salicylates act at a disadvantage although they still do some good. In this class he puts myocarditis and chorea, and says that the large effusions sometimes left in joints when the pain and fever have disappeared, rheumatic anæmia and nodules, are in a somewhat similar position. All these he says are the results of an infection and will persist although the infective activity has ceased. Third and lastly, there are the changes produced by healing processes which, of course, the salicylates cannot touch.

If we accept this explanation for the action of salicylates it would fit in with our theories fairly well and it would seem probable that we are dealing in these diseases with an infection be it an alimentary streptococcus of the non-hæmolytic type which may possibly be the same as Poynton and Paine's organism, or a filterable virus or possibly something else entirely, and at present not definitely known. It would seem probable that this infection tends to gain entrance largely through diseased tonsils or possibly occasionally by other lymphoid tissue and that the tendency to such diseased lymphoid tissue seems to exist more in certain families. It seems possible that in the early cases and in some cases of chorea that the infection does not pass beyond this lymphoid tissue but may elaborate a soluble toxin which is absorbed into the system and gives rise to symptoms. Bad hygienic surroundings, particularly exposure to cold and damp decrease the resistance and are potent factors in the liability to these infections. The recognition of potential cases and the clean enucleation of tonsils and adenoids before heart damage has occurred will materially lessen if not entirely prevent acquired heart disease which is the predominating cause of all heart troubles, and which recent statistics show to be the cause of roughly speaking 11 per cent of the deaths in Great Britain and in America. We have still, however, to acquire more accurate knowledge of the cause of chorea and rheumatism if we are to obtain the desired results in the first mentioned, and in those other cases in which the hearts are extensively damaged before we see them.

Sterilization with Burning Spirit.—H. Mayser (*Centralbl. f. Bakt.*, February 18th, 1925, p. 238) has made some experiments to test the efficacy of the common laboratory practice of sterilizing objects by pouring spirit over them and then igniting it. The object to be tested was smeared over with some culture from an agar slope, or was immersed in a broth culture and allowed to dry; the organisms used were *B. anthracis* and *B. typhosus*. When dry some spirit was poured on, ignited and cultures made in bouillon. Mayser found that flat surfaces, such as brass wire, glass rods, and spoons could not be sterilized thus. Hollow articles, on the other hand, varied in accordance with the heat-conducting nature of the material of which they were made. Basins of wood, a substance which has a very low heat-conducting power, were not rendered sterile even after the spirit had been burning for a minute, whereas glass, porcelain, or metal basins of medium and high heat-conducting power were sterilized by this means. These experiments indicated that it was not the flame itself which disinfected, but the heat generated by it.—*British Medical Journal*, April 11, 1925.

Bovine Tuberculosis.—The Royal Commission of 1911 had disproved Koch's statement that this form of tuberculosis was not a serious menace to man. In a recent investigation by Griffiths (*Lancet*, 1, p. 491, March 7, 1925) the bovine bacillus was found in 85 per cent. of cases of gland tuberculosis in children under five years of age; in bone and joint tuberculosis 30 per cent.; in lupus 66 per cent.; and in meningitis 66 per cent. These findings emphasize the urgent necessity for the pasteurization of milk.—S. M. Fisher, Harvey Club, London.

THE PHYSICIAN AND THE BENEFIT ASSOCIATION IN INDUSTRY*

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THE material for this short paper has been obtained from the records of a year's work as physician and surgeon of the Employees' Benefit Association of the Hamilton Works of the Steel Company of Canada.

At this plant, where the average number employed during the year was eighteen hundred, each workman on being accepted for employment becomes a member of the association and its assessments are stopped out of his pay. The association is controlled entirely by the men who also contribute all the money required for its operation. The object of the organization is to provide treatment and assistance to its sick and injured members. This is accomplished by providing a doctor, elected annually by ballot of the whole membership, who attends its sick members. The doctor may secure at the society's expense the necessary x-ray and laboratory examinations. He may also admit the sick member to the hospital when necessary where his maintenance at semi-private rates is provided by the society for a period of three weeks. The doctor may, in case of disease of the ear, eye, nose and throat, refer the sick man to the specialist, also elected by the men, and have his condition remedied at the expense of the society. After being ill for six days the sick member begins to draw five dollars a week for a period of thirteen weeks, should his illness last that long. A death benefit of $200 is also paid. It will thus be seen that the society's work is very comprehensive and is greatly valued by its members who take a keen interest in its operations. It is designed to care for the sick workman no matter what his condition and to make it unnecessary for him to use any of his own savings to assist his cure. There remains just one thing to make this association an ideal one from the point of view of the men, *viz.*, the provision of a dentist. Last Saturday evening I appeared before the members at their annual meeting and urged action along this line and steps have already been taken. When this has been accomplished I think there will be at this plant an organization rather unusual in industry providing a most comprehensive service all at the expense of the workmen. One would think that for all this the assessments would be very high but I have been informed that they have never been more than one dollar and a half per month and are usually one dollar.

It will also be seen that the physician to this society has a unique opportunity to serve the members. In private practice so often we find operation necessary, x-ray and laboratory work of great help, specialist's opinion and assistance desirable, hospital care indicated and yet because of the expense the patient must do without these things. But at this plant the situation reminds one of army days when the sick soldier could be treated to a conclusion because all facilities were available. Here the sick man may be thoroughly studied and the root of his trouble uncovered and removed.

A short account of the work done during the year may be of interest.

Four hundred and forty-six men were sick long enough to entitle them to benefits but unfortunately I did not keep a record of those ill for shorter periods than six days. One hundred and six were admitted to the hospital. Seven died, four from heart disease, two from cancer, and one from pneumonia.

The industry is one where there is a very great incidence of disease from respiratory infection. This is to be explained by the nature of the work in which the men are engaged. Great extremes of heat are required in the process of making iron and steel and as much of the work goes on in large draughty buildings with huge open doors or in some instances out of doors, it is easy to see how chilling of body surface is possible and congestion of the respiratory mucous membrane is produced. Steel workers are educated to the danger and when they have "run their heat" they will be observed to go at once and don woollen top clothes while they wait. When winter comes conditions are worse and for the first three months of the year influenza, coryza, bron-

*Read at the Conference on Industrial Medicine, Ontario Medical Association, at the Academy of Medicine, Toronto, January 14, 1925.

chitis, and pneumonia give me the bulk of my work. The company provide many heated shelters and is keen to do all it can to prevent these troubles but they continue to occur.

My next greatest trouble arises from the so called rheumatisms: lumbago, sciatica, and muscle pains about the chest are the most frequent forms, but acute rheumatism is often met with. I am ready to agree that there is no such disease as rheumatism, and that it is always a symptom of blood-poisoning from a focus of infection. I can only recall one or two men in the whole year's work who presented rheumatism as a symptom who did not have infection in the mouth. Many men had mouths that were foul beyond description and my experience has taught me to regard pyorrhœa especially of the lower incisors as the most prolific producers of blood infections. I have sent over three hundred to the dentist and have seen symptoms of rheumatism disappear many times from dental treatments alone. I had seven cases of acute rheumatic fever all with extensive pyorrhœa. I have removed many tonsils during the year blaming these for the blood infection, but I think I have enough evidence that the teeth should be attended to first when it has happened often in my experience that the tonsils rapidly become normal. I would like the pathologists to tell me whether the glandular tonsil may not be diseased because of infection about the teeth. Rheumatism in its various forms has been the cause of over half the money paid out by the society in sick benefits. I have told the members of the society that if they employ a dentist they will make a great saving. Some other more obscure conditions were found to be due to infection in some focus. A user of an acetylene torch went nearly blind in an eye and blamed the flame. I sent him to an eye specialist who diagnosed an infection in the optic tract and returned him to me to find a cause. Removal of very bad teeth resulted in immediate cure. Several cases of iritis were due to this cause. One man with what he called sciatica for fourteen months asked me for a bottle of liniment to rub on his leg. I asked him to let me see it which he reluctantly did, telling me meanwhile that seven doctors and two osteopaths had treated him. He had a fibrosarcoma as large as a goose-egg pressing on his sciatic nerve. Another man with symptoms of sciatica had tuberculosis of the hip. Patients are now stripped to the waist in the dressing room before they come into the doctor.

We have had four cases of mumps and one of measles. Four cases of acute pulmonary tuberculosis were found and admitted to the Mountain Sanatorium. Five other cases are at work under observation. Twenty-one cases were x-rayed to diagnose or exclude tuberculosis. One case of bone tuberculosis is now under treatment. Venereal disease has not troubled us much. These cases when discovered cease to be members of the society and are struck off the company's pay-roll until cured, so that I suspect they keep out of my sight. Three cases of gonorrhœa were found and fifty-six samples of blood were taken, twelve of which gave a positive Wassermann reaction.

The company pursues a very benevolent policy in regard to its old employees and when these men are no longer fit for the work of the mills and furnaces they are found lighter work as watchmen, clerks, messengers, etc. These men are in many cases suffering from organic diseases and are kept at work only by careful regulation of their habits and frequent examinations. I have a class of about twenty-five heart or heart and kidney cases who are at work daily, reporting regularly for examination. We are hoping to bring about greater cooperation between the doctor and the employment department so as to arrange suitable employment for men who could be called substandard.

The same condition which brings about so much respiratory disease is responsible for the appearance of a comparatively large number of cases of acute nephritis. The extremes of heat and chilling afterwards have given me five cases of acute nephritis with blood in the urine. I have also a number of cases of albumen in the urine who are constantly in danger of acute attacks and who are carrying on under special instructions with frequent examinations.

I am glad to be able to say that my observations so far have led me to the conclusion that the plant is almost free of industrial poisoning. Although benzol is manufactured here, there has been no evidence of poisoning from it. One would expect carbon-monoxide poisoning from the operation of blast furnaces and coke ovens but I have found no evidence of it. Occasionally a man is overcome from sudden exposure to gas in quantity, but as masks are freely provided and regularly inspected these cases are rare. Boils and skin infections are very common, so common that I am convinced that there is some factor in the work causing these. It is possible that it is the sweating and grime and dirt that these men are exposed to. Then they are all big eaters of

a diet rich in carbohydrates. Blood-sugar estimations have been made in about a dozen cases with only one showing an excessive sugar content. We have a few cases of dermatitis on the arms from cutting oils used in the machine shops. Next year we hope to do some laboratory work in connection with the carbon-monoxide poisoning.

The most troublesome cases are those with symptoms referable to the abdomen. There are many of these. In some of the mills there are eight hour shifts without stopping the process. The men snatch a few minutes to eat their lunch and return at once to their hot work. In other mills the men are on nights with a thirteen hour shift for a week and change over to days with an eleven hour shift. This constant changing of meal hours and sleeping hours is at the bottom of much of the indigestion, so-called, from which the men suffer. The company is doing its best to regulate the work and working hours so as to cause the least amount of hardship to the men, but the fact that the manufacturing process is continuous presents serious problems. Those with abdominal symptoms are investigated often by means of the x-ray. Many are relieved by regulation of the diet, care of the bowels and the exhibition of alkalies. Ulcer of the stomach or duodenum was operated on five times. Chronic disease of the appendix was found to be the cause of many cases of abdominal distress. Radical cure of hernia was done in eleven cases.

The company has been most ready to take advice from the medical department and to make changes which it believes will result in less sickness and loss of time. All industries are doing their best to reduce to a minimum the number of accident cases and when it is shown that sick men are more likely to be injured and to injure others, progress will be made with the management of these industries.

The chief advantage of this particular association is that the patient is cared for continuously until his treatment is completed. In the associations where the doctor does not follow the patient into his home and into the hospital the tendency is to discontinue treatment too soon because of the expense especially when x-ray, hospital, laboratory, and special work is required.

The only fly in the ointment, as I see it, is the remuneration given the doctor. Last year had I been paid at rates current in the city I would have received $9,811; I actually received $2,700. Certain other considerations make this less one sided than it seems, such as, workmen's compensation returns, family practice, etc.

A HEALTH WEEK IN LAMBTON COUNTY BY THE DEPARTMENT OF PUBLIC HEALTH, ONTARIO*

MANY communities do not yet realize the value of the public health officer and the necessity both in town and in country for a department of health to insist upon the carrying out of sanitary laws. To bring before the public of western Ontario the great advantages accruing from more sanitary conditions, and the desirability of a more extended and more effective health department, the Department of Health of Ontario determined to have sanitary matters generally brought to the fore in a "health week." Sarnia, a city of about 15,000 inhabitants, in a large agricultural county with an area of 1,000 square miles was chosen as an advantageous site for such an exposition. The experiment was undertaken with the approval and support of the Hon. Dr. Forbes Godfrey, Minister of Health for Ontario, and after due consideration by the Lambton County Medical Association and Lambton County Dental Association. The activities of the week were so arranged that not only would matters of public health be placed before the laity in the form of lectures, free clinics and exhibitions, and their importance emphasized from the pulpit and by means of the press and bright posters ,but also at the same time the interests of the medical practitioners as individuals would be satisfactorily protected. The various social and fraternal associations of the county endorsed the idea and pledged their hearty co-operation, and the business men of the city through their

*Abstract of Report by Dr. W. J. Bell of the Department of Public Health, Ontario.

chamber of commerce contributed active support both moral and financial. Representatives of all these various organizations were divided into groups and each group allotted one day of the health week over which they were to take special charge. Plans for the work were started about the 1st October, and by the 1st November the initial arrangements had been completed. The county was divided into small sections, and one public health nurse was placed in charge of each section which included as much territory as she could cover in two months. Four nurses was assigned to the work in the city of Sarnia where one public health nurse and one school nurse had already been working for three years. In addition to this nursing work, the district officer of health conducted a series of meetings at fifteen points in the county. The programme at each consisted of suitable moving pictures, music by local talent, and a health address by the district officer. These meetings were well attended. To secure the interest of the medical and dental practitioners, visits were paid to each one in their own office by the district officer of health and the plan of work fully explained, any misapprehensions were removed, and in the great majority of cases a promise of active assistance was obtained. Addresses were also given in the schools and before church organizations by many of the physicians and dentists of the county. Fully 55 per cent of the physicians and dentists assisted actively in the programme and 75 per cent of the school population in the county was reached. Advertisements regarding the programme and short leaders emphasizing the importance of public health were inserted in all the daily papers; longer articles appeared once a week. A special supplement was issued by one of the chief papers in the city on the Saturday immediately preceding health week, drawing attention to the addresses which were to be presented by prominent visitors from various portions of the province. At the same time posters, plain and illustrated, were displayed over the whole county and the clergy of all denominations made special reference to the object of the week in their sermons. The objects to be secured during the week were outlined as follows:—

1.—To disseminate information relative to health protection and disease prevention.

2.—To create an opening for active public health work.

3.—To promote a closer relation and a better understanding between the public and the medical and dental professions.

4.—To stimulate a demand for medical and dental health service on the part of the public.

5.—To introduce a free medical and dental service to such special classes in the community where the same is in urgent need and might properly be rendered.

6.—To promote the direction of matters and services distinctly medical and dental by the medical and dental professions respectively.

An interesting combination of health publicity associated with commercial advertising was evident in the main streets during this health week. A considerable number of the merchants generously gave valuable window space for the display of health exhibits, while many others dressed their windows from material out of their own stock, stressing in each instance, the value of the articles from a health point of view.

Eight special types of clinical work were conducted:—

1.—A children's clinic to include infant preschool, and school child.

2.—An adult medical clinic.

3.—An occupational disease clinic.

4.—A chest clinic.

5.—An orthopædic clinic.

6.—An eye clinic.

7.—A dental clinic.

8.—An ear, nose and throat clinic.

It will be noted that the first of these clinics were clinics chiefly for diagnosis, while the last three were for treatment. To obtain the advantages of an examination in these clinics, it was necessary for the patient to bring a letter of reference from his family physician. After examination a letter indicating both the diagnosis or the special treatment recommended was sent to the physician by mail. At the diagnostic clinics the examination given was very complete but no treatment was recommended and no diagnosis was given to the patient; a letter only was dictated which had to be handed back to the physician or sent by mail. This procedure made it necessary for the person examined to go to his own physician to obtain the results of the examination. In the general medical clinic

special emphasis was placed on the desirability of an annual physical examination by a medical man. The illness hazard in any industry was stressed; and in the tuberculosis clinic the endeavour was made to keep the idea of prevention prominent, making treatment the secondary consideration. To the public these clinics presented exceptional facilities for clinical advice; for the medical profession it provided what practically amounted to a short post-graduate course by the special consultants who were supplied by the Ontario Medical Association. The total number dealt with at the clinics was 1,158. More might have been dealt with, but it was felt that a thorough examination of each accepted case was more important than a long list of cases. A further feature of special interest to the physicians was the round table talk held each night during the week by the special consultant. The chairman of the local clinical society acted as the presiding officer. Discussions were based on the clinical material presented at the special clinics during the day; each discussion was opened by the special consultant for that day's clinic. After material suggested by the clinic of the day had been disposed of, discussion was opened to permit of the introduction of any medical subject included in the department of the consultant of the day. While active treatment was thoroughly dealt with the preventive aspect was kept prominently before the physicians in all these discussions.

The total cost of the health week exclusive of the salary and expenses of the regular staff amounted to about $2,000.00. The results were acknowledged by all to be of great value, partly on account of the instruction in health matters given to the public both at the clinics and in the evening lectures; also on account of the actual personal medical services given to those not otherwise able to obtain them, and further, on account of the development of an increased interest in health matters both among the profession and by the public.

A PLEA FOR THE USE OF THE "COMBINED TREATMENT" IN AFFECTIONS OTHER THAN THOSE OF THE EYE

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Toronto

EVER since I found this form of treatment so exceptionally reliable as to its curative properties in many diseases of the eye, I have been under the impression that it ought to be of some service to the physician in a certain type or types of disease, which belong to general medicine. This feeling has grown stronger through lapse of time. As all my advances have been very coldly received, in fact not given a hearing, I have decided more fully to bring it again to the attention of that branch of the profession known as that of internal medicine; for I am convinced that in this refusal to yield to my suggestion and try the treatment, an error of judgment has been made.

"The Combined Treatment"[1] consists of the use of pilocarpin hypodermically, and the internal administration of mercury and the iodide and bromide of soda.

I shall give a short summary of cases of disease of the eye in which its use has given good results. Then I shall put forth my idea of the mode of action of this treatment; and then make my plea for its more extended employment.

In regard to the cornea I shall make reference to a case of smallpox pustule of the cornea of one eye, which left a large white spot, called a leucoma, which covered the entire cornea, and vision was not much more than perception of light.[2]

Under the use of "The Combined Treatment" this leucoma was removed and normal vision again restored. Also the general health of the patient was much improved with a gain in weight of ten pounds. Again in various ulcers of the cornea it has acted quickly and the healing process has been so thorough that no scar was left.

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The scars of the cornea from old ulcers and from phlyctenular keratitis, which interferes with the vision, have been so favourably acted upon as to give much better vision and sometimes restored it in full.

In case of a rheumatic affection of the cornea of very long standing (of both eyes) in which the infiltration had gone on to well marked calcareous degeneration, its use has ended in a gradual return to about normal corneal tissue and most decided improvement of vision. This same patient was so affected by rheumatism that he walked with great difficulty with the aid of two canes. This affection has been so completely got rid of, that he is able to do all kinds of work even to running up and down on ladders. This occurred years ago and he has always remained well, as I know from personal observation.

In regard to the dreaded disease, sympathetic ophthalmia, which has been looked upon as so uncontrollable, "The Combined Treatment" can control and cure even the worst forms of this disease. Here a copious exudation binds together the different structures of the eye, and the iris adheres to the lens, and the exudate fills the pupillary area.

"The Combined Treatment" removes all this exudation, so that the eye is restored to a practically normal condition, as regards the vision and the tissues, and there is freedom from relapses.

In ulcers of the cornea with cyclo-iritis and pus in the anterior chamber recovery follows its use.

In cases of relapsing iritis with bound down iris and exudation into the pupillary area, and of course impaired vision, without an operation, which is often of little value, the action of "The Combined Treatment" removed all exudation giving good vision and freedom from relapses.

In cases of certain diseases of the fundus of the eye "The Combined Treatment" is of decided benefit; also in cases of marked diplopia due to central nerve-lesions.

Also the marked and powerful curative action of this treatment never in any respect injures the tissues of the diseased or healthy eye, or of any part of the body; for its action is always physiological.

My theory as to its action is that it stimulates the nerve-centres to a decided hyperactivity and that this greatly increased activity never at any time causes any inflammation of other tissues or organs. Hence it is a remedy with great powers, but at the same time, safe. As its action is always physiological, any anxiety that its effects have to be watched, lest it injuriously affect other organs or tissues, is done away with.

I am writing in this positive fashion for the results in a great number of cases since I began the use of this treatment, thirty-five years ago, have justified these conclusions.

I now appeal to physicians that they give "The Combined Treatment" a chance, to verify the powers which I have ascribed to it. I shall not name the diseases, but should like it to be tried in some cases of nervous disease, as sclerosis, especially the disseminated form, and of hæmorrhagic affections, such as certain forms of cerebral effusion and hæmorrhage. This treatment has given excellent results in retinal effusion and hæmorrhage in the yellow spot region. Of course without its aid these hæmorrhages may be, and are absorbed, but so slowly that the retinal elements cannot regain their normal position, hence irregularity of the letters, and also poor vision. The use of this remedy, however, causes such rapid absorption that there is a minimum amount of damage, and hence good vision with normal appearance of letters, and, also it must be added, a permanently curative effect.

In regard to cerebral hæmorrhage, if rapid removal of the hæmorrhage were able to be accomplished, then I hold that the cases of recovery which physicians now have, but associated with evident injury to the tissues, would often be replaced by a practically normal condition as in the case of the eye. This ability which "The Combined Treatment" possesses to bring about this rapid absorption, is the chief reason that is of such service in cerebral effusion and hæmorrhage. I think it but right also to take into consideration its restorative effect upon the tissues.

The retinal elements of the eye are certainly as sensitive in their way to the ill-effects of hæmorrhage as the cerebral tissue, and hence a comparison of the respective conditions is allowable. In considering this method of treatment do not forget that the action of "The Combined Treatment" is always physiological. The physician, as matters are at present, is not, cannot

be satisfied with the efficacy and certainty of the treatment generally followed and practised.

In conclusion, if we have a remedy, which acts so beneficially in regard to the delicate structures of the eye, where its operation can be seen and closely observed, why I query, should it not be as useful in some diseased conditions of other organs and tissues of the body?

As "The Combined Treatment" is now recognized by the foremost book on diseases of the eye on this continent (Fuchs' *Text-Book of Ophthalmology*—Duane), I trust that it may receive, at least, the courtesy of consideration.

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THE X-RAY TREATMENT OF TONSILS AND ADENOIDS*

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ON account of the far-reaching effects of infective foci existing in teeth and tonsils in producing or keeping up many ills in other parts of the body, the question of the proper treatment of diseased tonsils must seriously occupy the attention of the medical profession. A difficulty in the operative treatment of diseased tonsils is to remove all the tissue and many of us have seen patients in whom a portion of the tonsil has remained after tonsillectomy, a portion which has apparently given rise to infection in other portions of the body. In the opinion of the writer tonsillectomy cannot be successfully or satisfactorily carried out under a local anæsthetic. One of the advantages of the x-ray treatment of diseased tonsils is that it is not followed by a painful throat. In the words of Dr. Carr, of Lyons, N.Y., the treatment with the x-ray is as effectual as that with the knife. Patients past middle life; those debilitated by chronic diseases of the heart with loss of compensation, by arteriosclerosis, diabetes, nephritis, goitre, and advanced forms of rheumatism are all poor operative risks, but may be successfully treated by means of x-rays.

The object of the x-ray treatment of infected tonsils is the permanent removal of pathological tissue from the throat, leaving the parts in their normal condition, and followed by permanent relief from infective disease, local or remote, for which the treatment has been undertaken. This form of treatment has not been long under trial but we have good reason to be satisfied with the results. We cannot expect all pus organisms to disappear from the throat after this form of treatment for such bacteria are constantly found in the nose and mouth. We must judge by the larger results; namely, the disappearance of the symptoms of a chronic infection. If a chronic bronchitis disappears; if a lesion of the skin vanishes; if a patient experiences freedom from recurring attacks of a pneumonic character, then surely it is permissible to say that a cure has been effected. If, on the other hand, the attacks of follicular tonsillitis persist then we must admit that the treatment has failed.

The writer has treated quite a number of patients in the last two years; there have been some failures, but Witherbee's claim of eighty per cent of cures is a modest one. The dosage must be carefully regulated; the patient with a short, thick neck, and the stout, thick-set individual past middle life, require more treatments, and the dosage must be increased gradually. Sometimes in patients exhibiting recurrences of their disease it was noted that tanning did not occur even on using two filters instead of three. The majority of the resistant cases have been in young children in whom there is proportionately a larger amount of lymphoid tissue than in older patients, and as a consequence a poorer contraction of the

*Read at the annual meeting of the Canadian Medical Association, Ottawa, June, 1924.

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fibrous stroma is induced. In some of these young patients the treatments were continued, using an eight instead of seven inch spark and sometimes four filters in place of three.

The usual technique followed is that of Dr. Richards, of Toronto; seven-inch spark gap, five milliamperes, three filters of aluminum, ten inches distance, five minutes' time. Eight treatments, or as many more as may be necessary, two weeks apart. In following this technique one meets with many idiosyncrasies; some individuals are affected much earlier than others, therefore one should always examine the patient carefully before each treatment for signs of tanning, soreness in the glandular or muscular structures of the neck, or dryness of the mouth or throat, as the result of the previous treatment. The dryness of the mouth is usually due to not protecting the parotid gland sufficiently. Often a patient, after having undergone several treatments, will complain of much severe pain and difficulty in swallowing. This may be due to a previous treatment and not to another attack of tonsillitis. In these cases further treatment may be delayed till these symptoms pass off but the end results will be good.

The danger of the patient coming in contact with the current is not very great where there is a well grounded wooden table, plenty of protective lead rubber, and the patient is under the constant and vigilant eye of a well trained technician. Young children may require special apparatus for protection, or treatment may have to be withheld until they are old enough to be easily managed. The danger of x-ray burns is not very serious, provided the technician uses the proper machine setting and does not forget to put in the necessary number of filters. The majority of x-ray burns are caused by neglect to put in the filters.

The following cases are illustrative of several of the various conditions:

Case No. 1.—Male, aged fourteen years. When seen he was pale and had been in delicate health for some time; he was undersized and underweight. Had been behind with his studies on account of his frequent colds and digestive disturbances. He was scarcely ever without a cough, and of late had been running a temperature of 100° to 101°. He was a mouth breather. Examination of the throat showed the usual enlarged, unhealthy pair of tonsils with the pillars also involved. The submaxillary glands were enlarged. He was kept in bed till the temperature became normal; and was then given the usual number of x-ray treatments for the infected tonsils.

At the present time the tonsils are normal in size and appearance. The enlargement of the submaxillary glands has disappeared. He still holds his mouth open, but his adenoids have disappeared since the treatment of the tonsils. He has now no cough and is not liable to take cold. He is a good student at school and is always able to join in games. When treatment was commenced on August 22, 1922, he weighed eighty-three pounds, now he weighs 120 pounds. He has grown four inches in height since the commencement of the treatment.

Case No. 2.—Female, aged fifty-two years, suffering from rheumatoid arthritis. Tonsils large, red, and crypts discharging muco-pus. After four x-ray treatments the tonsils were reduced to a small pale mass of fibrous tissue on each side. Rheumatoid pain and stiffness, which were severe enough to keep the patient awake for nights together, have practically gone. Treatment is being continued.

Case No. 3.—Male, aged fifty-two years. A farmer with a thick, short neck and massive jaw. Came to my office August, 1923, complaining that he was not feeling well, and thought there was some poison sapping his strength. Breath offensive. He tired easily on exertion. His throat has been sore, but he never had quinsy. The tonsils red and moderate in size. From August 7, 1923, to January 9, 1924, patient was given ten x-ray treatments with the usual technique, and appeared to be improved in general health. He next came under observation May 14, 1924, with many of his joints stiff, swollen and deformed with arthritis. Ten more treatments were given with the result that by October his joints were almost normal.

Case No. 4.—Female, aged thirty years; has always been subject to throat trouble. Tonsils "removed" several years ago. Remnants of tonsil tissue present on both sides. Three treatments were given. At the fourth treatment, after giving the left tonsil three minutes exposure, it was observed that the filters had been forgotten. In two weeks a ring of erythema on the left side appeared, and no further treat-

ments were given. After eleven months the patient returned with a slight tanning of the skin on the left side following the erythematous ring. On the right side the tonsil was red and inflamed with a corresponding painful, glandular swelling in connection with it. The absence of trouble on the left was notable and was regarded as conclusive proof of the therapeutic efficiency of the treatment. It was evident that the left side had quite sufficient treatment to cause a cure, while the right had not. It is often difficult to determine the necessary dose to give without endangering the patient.

Case No. 5.—Female, aged eight years. Patient was an unusually fat and well developed child who had had frequent attacks of tonsillitis accompanying gastro-intestinal and respiratory ailments. She was given eight treatments with a six-inch spark gap. In two months, she had another attack of tonsillitis and the tonsils exuded a muco-pus from the follicles. She was given eleven more treatments, still using the six-inch gap. Eight months later she had a second attack of tonsillitis but each of these attacks were of a milder nature; she has had also far less sickness from colds and stomach trouble than before the x-ray treatment. At the present time she is getting a third course, using an eight-inch gap with other factors of the technique as before. Out of 100 cases treated, while quite a number required many more than the usual eight treatments, the above is the only one to have contracted a second attack of tonsillitis following the treatment. Yet this treatment will eventually cure her entirely, if carried far enough

Case No. 6.—Female, aged twenty-two years. suffered from chorea and stomach trouble for several years. From December, 1923, to the following May, she took nine treatments for infected tonsils and has been entirely well ever since. The rheumatism and chorea clear up with astonishing rapidity after treatment of infected tonsils.

Case No. 7.—Male, aged sixty-five, weighing 225 pounds, with a systolic blood pressure of 200. He was suffering from chronic rheumatism and a large pair of septic tonsils. He called at my office for advice as to removal of his tonsils, and was given thirteen treatments with a seven inch spark gap. As the result his tonsils became considerably smaller and his rheumatism disappeared.

These cases are given as illustrations of the excellent results which may be obtained by the use of the x-rays. A final report of many of the cases cannot be given at the present time as too short a period has elapsed since treatment, but it is the firm conviction of the writer that every case of infected tonsils and adenoids can be cured with x-ray therapy if we have the cooperation of the patient, and are willing to follow up the case with reasonable intelligence and persistence.

Bronchial Asthma and Allied Allergic Disorders.—A room has been installed in the University Hospital in Philadelphia for the study of bronchial asthma, allergic coryza and hay-fever, where it is possible to observe patients under controlled conditions of environment in relation to the presence and quantity of specifically allergic inhalation substances. Provision has been made to study the effects of alteration of barometric pressure and wet and dry bulb temperature in these disorders, including those cases of asthma in which allergic sensitivity cannot be demonstrated. The experiments, here recorded by Simon L. Leopold and Charles S. Leopold, Philadelphia, seem to indicate that it is possible by means of this equipment to render a room relatively dust free, efficient to the point of keeping a patient with dust asthma free of asthmatic seizures. It seems evident that house dust contains one or more specifically allergic substances capable of producing an immediate constitutional reaction, and that this reaction cannot be explained on the basis of mechanical irritation. Changes of barometric pressure and wet and dry bulb temperature have had no demonstrable effect on the clinical symptoms of those patients so far observed. This report is to be regarded as preliminary, in order to record the type of room which has been used and its equipment. Further studies are in progress and will be the subject of further communication.—*Jour. Am. Med. Ass.*, March 7, 1925.

PRIMARY SARCOMA OF BLADDER

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SARCOMA is one of the rare types of malignancy occurring in the bladder. It is estimated that from four to five per cent of primary malignant bladder tumours are sarcomata. This probably errs on the higher side. Munwes[1] in 1910 collected 107 cases from the literature, and other cases have been reported by Bockenheimer[2], McKenna[3], Stein[4], Binney[5], Mayo Clinic[6], and Geraghty[7]. The Mayo Clinic report one case in 262 cases, and Geraghty two in 180 cases. The comparative rarity of the occurrence of this type of malignancy especially in cases which have been observed clinically and completed with a post mortem examination warrants a report of the following case which came under our observation:—

B. C., male, aged thirty-three, farmer. Admitted July 11th, 1923.

Complaint.—Acute retention. Pain.

Past History.—Usual childhood diseases. Tonsils and adenoids removed at age of fifteen, previous to which he was subject to quinsy and tonsillitis. He suffered from an attack of pleurisy and pneumonia in 1909. He was in the Canadian Expeditionary Force from 1914 to 1917, and developed in France an acute attack of rheumatism, which left him with ankylosis of both wrists and limitation of movement of both knees and right elbow. He denies any venereal disease.

Family History.—Negative. Married eight years; wife alive and well; has one child, alive and well. No family history of tuberculosis, syphilis or cancer.

Present Illness.—No genito-urinary symptoms of any character until ten weeks ago, when he noticed a slight frequency of urination, first by day and then by night. This was followed in several weeks by burning pain on urination, mostly terminal, and then for the first time he noticed a few specks of blood in the urine. Three weeks ago he developed an acute retention which was relieved by catheterization. Since then he has had to be catheterized three times daily, and is entirely unable to void.

Present condition.—The patient is fairly well developed and well nourished. Both wrists are completely ankylosed, with limitation of movement in the right elbow. Both knees are limited to one-half movement. The physical examination of the genito-urinary system reveals nothing abnormal; examination of prostate per rectum was also negative; the urine has a specific gravity of 1,018 and shows albumin, but no sugar; there are great numbers of red blood cells present with pus. The phenolphthalein test shows an output of 25 per cent in the first hour, and 10 per cent for the second hour.

Examination otherwise negative.

Diary.—Patient was catheterized three hours after admission and 12 ozs. of bloody urine was removed, giving him relief from pain.

Cystoscopy.—July 13. No. 22 French cystoscope introduced with ease. Urethra normal. No obstruction. On the right lateral wall of the bladder and involving the trigone and both ureteral orifices is a large tumour mass, with a shaggy surface, in places showing surface necrosis. This bleeds easily to touch. The mass is the size of an orange and the edges are indefinite. The base is broad.

Cystoscope.—July 17. The findings similar to above. A portion was removed for microscopic examination.

July 20.—Suprapubic systotomy for permanent drainage. The mass is large and infiltrates the bladder wall to the vault; the condition is inoperable. A second portion was removed for microscopic examination.

Microscopic Report.—Round celled sarcoma.

Course.—X-ray was administered in large doses and the patient was made comfortable.

August 7.—Seventeen days after operation the tumour mass is growing out through the suprapubic wound, and direct X-ray was of no benefit.

August 19.—Metastatic growth in the right thigh; subcutaneous.

September 5.—Metastatic growth in the left lumbar region. The mass now had grown out

through the suprapubic wound to the size of a large orange.

October 4.—X-ray of the chest, negative.

November 3.—Died.

Post mortem findings.—The body is that of a markedly emaciated adult male. There is a huge fungating mass (14 cm. in diameter) protruding above the suprapubic region with a central opening apparently into bladder. There is a firm subcutaneous tumour, 3 cm. in diameter, in the left lumbar region behind. There is a large tumour, slightly larger, under the skin of the inner and posterior surface of the right thigh. Two small tumour metastases are present in the right axilla.

Thorax.—On removing the sternum, a small tumour is noted on the under surface of the junction of the sternum and the second costal cartilage. The examination of the lungs reveals no abnormality save for diffuse adhesions over the external surface of both. No evidence of tumour metastases found in lungs. The heart is not enlarged. There is a small tumour in the anterior wall of the right auricle and also one 3 cm. in diameter in the interauricular septum. The mitral orifice admits but one finger and both cusps show marked thickening of their free margins. Marked thickening of the base of the aortic cusps. No other abnormality is noted in the heart. There is a marked degree of anthracosis in the bronchial lymph nodes.

Abdomen.—A few cubic centimetres of clear fluid in the peritoneal cavity. The liver is not enlarged; colour, shape, and size normal. No evidence of metastases. The spleen is not enlarged and shows no obvious abnormality. The stomach and intestines are negative save for two tumours in the wall of the jejunum, one 3 cm. in diameter, and the other smaller. Pancreas is negative.

The wall of the bladder is tremendously thickened by tumour growth; in fact the normal outline or the bladder is entirely lost. The fungating mass in the suprapubic region is entirely a tumour extension through the suprapubic wound. The bladder contains a moderate amount of purulent fluid. Large tumour metastases are found in both psoas muscles. The left kidney is somewhat enlarged and shows numerous tumour metastases the largest being about 4 cm. in diameter.

The right kidney similarly shows several metastatic nodules, one is especially large—about 5 cm. in diameter. The ureters are both dilated and filled with pus. Extensive tumour infiltration of the lymph nodes behind the bladder and between the kidneys.

Diagnosis.—Sarcoma of bladder with generalized metastasis; chronic pleurisy; Anthracosis; chronic cystitis; bilateral pyo-nephrosis.

Discussion.—It is commonly stated by most authors that sarcoma of the bladder occurs with greater frequency in children and in those of advanced years. Many exceptions occur and no age period is exempt. Ewing[8] states "They (sarcomata) produce a large globular or polypoid intravesical growth or diffusely invade the bladder wall. Their structure varies, round, spindle, and mixed cells predominating. Vascular myxosarcomata of large size are reported by Kauffmann; an osteo-chondrosarcoma is reported by Beneke and W. Fischer." A case of lymphosarcoma has been rported by Chaffey, and of angiosarcoma by Jungano.

Clinically these cases may be divided into four groups:—(1) children; (2) the latent type; (3) rapidly growing; (4) secondary change in a previously benign tumour.

Metastases occur usually by means of the blood stream, and by direct continuity, and of course extend to any portion of the body. Sarcomata metastasize earlier than do the epithelial tumours, and this is important as regards treatment and prognosis. There was no bone involvement in this case. The primary site in many of the reported cases could not be determined. This may occur in any area of the bladder, but the region of the junction of the trigone and bladder was apparently the commonest site of origin. The symptoms do not vary in any special way from those of any other vesical growth. The usual symptoms of hæmaturia, frequency and pain occur. The rapidity of increase in the intensity of symptoms is somewhat suggestive.

The diagnosis of a malignant vesical growth is made, of course, by cystoscopy, but whether it be of the epithelial or connective tissue type, is determined by a microscopic examination. There is no particular cystoscopic picture characteristic of sarcoma. And it may be stated here that an error may arise even in microscopic examination; a papillary tumour with secondary inflammation may be and has been mistaken for sarcoma. The particular type of the sarcoma is also at times difficult to establish and a careful examination is necessary. In this case the opinion for a time varied as to whether the growth was a lympho-sarcoma or a round-celled sarcoma. Dr. Horst Oertel, of the Royal Victoria Hospital, Montreal, to whom the slides were sent for his opinion, decided on the latter, that is, a round-celled sarcoma, for the following reasons:—

1.—The growth does not possess a definite uniform reticulum. Where a fine fibrillar network exists, it does not present so intimately and generally a part of the tumour as a lympho-sarcoma shows. Moreover, a great part of the tumour grows without any reticulum.

2.—Cells are frequently arranged in clusters and of perivascular distribution and arrangement. The tumour is generally well vascularized.

3.—Tendency to softening is pronounced, which in his experience, is not the case in straightforward lympho-sarcoma.

4.—The cell type is uniformly of small variety, more so than is the case in lympho-sarcoma.

5.—It appears from the metastases that these are of nodular type and hæmatogenous origin.

Treatment.—If localized, early excision and if necessary cystectomy following ureteral transplantation. If inoperable x-ray and radium. The resistance of this type of growth to x-ray was very well exemplified. The tumour extended by direct growth out through the suprapubic opening, and a mass 14 x 5 cm. was present on the surface of the abdomen although intensive treatment by x-ray was administered; no apparent diminution in rate of growth was observed.

Munwes showed that in sixty-nine cases, thirty-eight died soon after operation, and only three were considered cured. In Albarran's[9] twenty-six patients thirteen died after operation and ten had rapid recurrences. With these reports at hand, one cannot have any great expectations of a radical cure.

Summary

1.—Primary sarcoma of the bladder is rare; it occurs in 4 to 5 per cent of vesical malignancies.

2.—There are no special clinical signs or symptoms to differentiate it from epithelial growths.

3.—Marked resistance of the growth to x-ray therapy.

4.—It is the most malignant of vesical tumours.

5.—Extensive metastases occur.

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INTRACTABLE SCIATICA—THE SACRAL EPIDURAL INJECTION—AN EFFECTIVE METHOD OF GIVING RELIEF

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WE might appropriately begin this report by defining our terms—sciatica and intractable. The term sciatica, on account of uncertain definition and looseness of description, was the cloak for a multitude of unrelated evils, until a number of years ago Déjerine, followed by Sicard, clearly outlined the condition. After sifting a number of general medical, local surgical and traumatic, as well as the obviously orthopædic conditions associated with more or less atypical sciatic pain, they found there remained a considerable residuum of what they considered typical (sometimes called idiopathic) sciatica, for which no obvious cause could be demonstrated. As a result of their researches they came to the conclusion that they were due to an inflammation of the structures in certain intervertebral foramina. The involvement of the nerve roots passing through these foramina they termed "funiculitis." When the trouble was located in the second, third, fourth and fifth foramina, it gave rise to lumbo-sacral pain, sometimes termed backache or lumbago. When the third, fourth and fifth lumbar and the first and second sacral roots were involved the result was sciatica. Frequently there was a combination of the two.

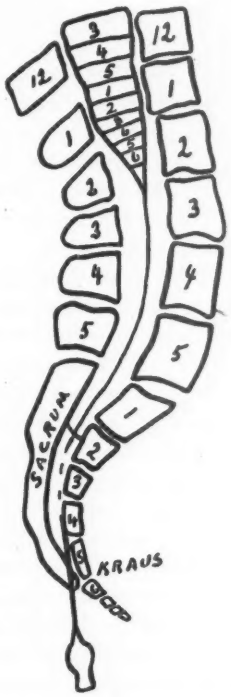
In recent years with the tendency to attribute the causation of so many diseases of ill-defined origin to focal infection "idiopathic" sciatica has been, probably with very good reason, received into this fold. It is not unlikely that a great majority of such cases, syphilis having been excluded, may be attributed to infection

from teeth, tonsils, sinuses or even the gall-bladder. Martyn[1] treating them on this basis claims practically 100 per cent of cures. On the other hand Rosenheck and Finkelstein in a recent communication[2], referring to their previous unsatisfactory experiences with the method described below by the author attribute practically all cases of "idiopathic sciatica" to orthopædic defects, particularly sacro-iliac disease. They follow the theory and practice of Baer and Scofield, and where the cause is demonstrably orthopædic there can be no room for criticism. In the speculative cases, however, their method is not only strenuous but cumbrous and prolonged, and its underlying basis is really a stretching of the nerve. They therefore lay themselves open to their own criticism of the injection method, "since they attack the consequences of the affection and not its origin."

The symptomatology generally agreed upon includes pain in any position, and particularly in changing position; in the lower part of the back and down the back of the thigh, sometimes extending to the malleolus; the characteristic standing position and gait; the tender areas at the point of exit of the nerve from the great sciatic notch, in the back of the thigh, and in the popliteal space; the frequent absence of the Achilles reflex, Lasegue's sign; and another which the author has found to be characteristic of this disease. This consists in placing the patient on his back, raising the affected limb to as near a right angle with the body as possible, then gripping the foot just behind the toes and dorsiflexing it sharply. This almost invariably in sciatica causes a sharp pain at the sciatic notch. This for convenience in reference might be termed the "foot-jerk" sign.

The treatment, obviously, is to remove any possible cause. When this is undiscoverable or irremediable, and when the pain persists, one has a choice of a vast number of procedures of greater or less avail. As these are to be found in any text-book that deals with the subject it will be unnecessary to cumber this report with them.

It is when these methods have failed that we have the so-called intractable sciatica, and here the sacral epidural injection has in most cases a remarkable effect. This method was evolved separately, early in the century by Cathelin[3] and Sicard, and its original application was to curb enuresis, in which it proved of uncertain value. Some years later the method was revived for its present purpose in France and America. The procedure is as follows: The patient is placed in the knee-chest or knee-elbow position. The sacro-coccygeal region is washed with alcohol and then painted with iodine. At its coccygeal junction a small depression between two lateral tubercles is found at the end of the sacrum. Into this depression a preliminary injection of 2-3 cc. of 1 per cent novocaine is made. A large needle of lumbar puncture size is then inserted along its whole length into this depression, the sacral canal, parallel with the sacrum and with a 20 cc. glass syringe that quantity of 1 per cent novocaine is injected. (See illustration). This is followed by the injection of 50-100 cc. of sterile Ringer's solution, or normal saline, or liquid petrolatum, the quantity varying with the size of the patient, his build, the condition treated, and above all on the resistance encountered to the entrance of the fluid. Three or occasionally four of these injections are given at intervals of one week. There is usually a certain degree of improvement with each injection.



There is practically no contra-indication.

Liquid petrolatum is frowned on by some on account of the remote possibility of fatty embolism. In actual use it appears more efficient than the other two, but there is criticism as to its ultimate disposal. If one misses the canal and injects dorsal to the sacrum there is merely an infiltration of the tissues, which neither benefits nor harms. The only risk, and that depends on faulty technique, is in injecting ventral to the sacrum. There important structures may be perforated or penetrated and possibly serious damage done.

The basis of the favourable reaction is not well understood, though different theories have been offered to account for it:—(1) The anæsthetic effect of the novocaine. This is so obviously transitory that it needs but to be mentioned to be dismissed. (2) The tension on the cauda equina, a "nerve pressure," somewhat analagous to nerve stretching. This appears to be reasonable but raises the question, "why are the motor fibres totally unaffected?" (3) A congestion in the neighbourhood of the irritated structures, somewhat analogous to counter-irritation which may stimulate resolution. This for the present seems to be the most acceptable explanation.

We may now proceed to the description of a few illustrative cases of which the author has had several and none of which have failed to be distinctly benefited. It is to be noted generally that the more clear-cut the sciatica, the more effective was the treatment, and where it was combined with other factors, as for example lumbo-sacral pain, the latter was relatively little affected.

Case 1.—F. X. G., thirty-eight years old, has suffered from many complaints and has been operated on several times, but for a few years before onset of present condition has been in good health. In the fall of 1922, while cranking his car he suddenly felt a severe pain down left leg, and had to be taken home in a cab. He remained in bed for a week or ten days during which he was fairly comfortable, but when he got up and tried to resume his occupation things got steadily worse, until he could walk only with difficulty with the aid of a cane, suffering much pain in the process: some days he found it impossible to get up at all. For the next eight months he tried medication, baking, stretching, strapping, posturing, radiant heat and finally chiropraxis, but obtained little relief. Finding all methods unsatisfactory and his means exhausted, he continued to suffer in silence. In November, 1923, the author volunteered to try the epidural method on him. He submitted hopelessly. After a thorough examination which excluded other conditions and established the sciatica, he was given three weekly injections. After the first he said, "Doctor, I feel better but I don't believe it." After the third he said, "I feel almost well and I can't deny it." He has been seen since, occasionally, and reported himself as in very good condition, still conscious of a jar when stepping off a curb, but able to get along very well and quite contented.

Case 2.—H. B., male, forty-seven years. Previous history irrelevant, except for a similar attack of a few weeks' duration about five years before the present one. He was seen in December, 1923, complaining of constant dull ache in right hip and down both legs, particularly in the right. The pain became excruciating when making any sudden movement involving lower part of body. When changing from a recumbent to a sitting or from sedentary to standing position the paroxysms were often intense. With the aid of two sticks he could stand for a few minutes but soon became pale, broke into a cold perspiration, and felt faint from the pain in the lower part of the back. This condition had persisted for two years; for past year he has had to be lifted into and out of his car to get to his office. When there he sits in one chair propped up with pillows and his legs are stretched across another chair. He has been strapped and splinted and bandaged, and has received massage, electrical, and x-ray treatment; has had his right leg (nerve?) stretched. Several suspicious teeth and roots have been removed; he has refused tonsillectomy which was advised. Previous examination which has included almost every part of the body has not indicated any *locus morbi.* The diagnosis given was "sciatica probably due to rheumatoid arthritis."

When seen by the writer, the examination generally was negative. Lumbar puncture disclosed nothing new. Neurological examination showed tenderness at Valleix' points, Lasegue's sign and particularly foot-jerk sign (as above) in both legs, especially in the right. Objec-

tively, there was some diminution to sensation, coton wool and pinprick, over the 5th lumbar distribution in the right leg. The reflexes were normal excepting the right Achilles which was gone; there was no atrophy. The patient was given three treatments, at intervals of a week; during this period he was kept in bed. Within a few hours after the first treatment he could lie or turn in bed with much greater comfort than had been the case for the preceding two years. Three days after the last treatment he was allowed out of bed, and found that he could walk around with the help of his sticks. Within the following week as he began to believe he was well, he walked part of the way to his office with the help of a stick. Six months later he walked as freely as he ever did, with no complaint except a rare kink in the back as he stepped off the curb.

Case 3.—Mrs. W. L. Seen in the Western Hospital in August, 1924. She had been in bed for a year with severe sciatic and lumbo-sacral pain which had not only prevented her from walking during this period, but which gave her pain when she tried to sit up. She had been thoroughly examined and given several varieties of treatment by different physicians, one of whom suspected a tumour of the spinal cord, on account of the presence of a Babinski sign on the right side in addition to her other symptoms. When seen she was a rather stout woman of thirty-five years, in good general condition, who suffered an intense pain when she tried to walk, or to sit up. The pain was of a sharp shooting character that extended all the way down the back of the thigh and leg to the dorsum of the foot. There was slight diminution of sensation to cotton wool and pinprick over the shin and outer side of the foot to the roots of the first and second toes (fifth lumbar distribution). There was also marked tenderness at the point of exit of the sciatic nerve. Lasegue's and the foot-jerk signs (Viner's) were definitely present. The movements of the limb was practically normal, any limitation being due to pain and not to weakness. There was so little if any wasting that it could not be adequately measured. Sense of position of the toes and of the other joints was normal. The reflexes were normal excepting that the knee-jerk in the right limb was all but absent, and the Achilles reflex doubtful. In addition there was a right Babinski which was never accounted for. The blood Wassermann and the spinal fluid were negative, as was the x-ray of the lower spine.

Such was the patient's condition when treatment was instituted. In the course of about eighteen days she was given four epidural injections. At the end of the first one she visited other patients in the ward. At the end of the last she promenaded around the ward, although somewhat limpingly; a day or two later she left the hospital. During the past six months she was seen a few times in a very contented condition, walking about and attending to her housework, and generally well pleased with her present state. The last examination showed that the Babinski which had disappeared after the first or second injection was still absent, the knee-jerk was much more active, the pains had completely disappeared, and the only indications of her previous condition were a barely perceptible limp and an inability to throw a sheet across the bed without a "crick in the back."

The author, impressed by his favourable results with this method in intractable sciatica, decided in extension of this procedure to do some research. He could not see why pain from other conditions involving nerves arising from the same general region of the cauda equina should not be similarly benefited by this method. Therefore in experimenting on cases of pain in the lower segments of the body he has tried coccydynia, cancer of the rectum, lumbo-sacral pain, traumatic neuritis, amputation-stump pain, locomotor ataxia, rheumatoid arthritis, etc. and contemplates trying various other lesions low down in the pelvis, as well as endarteritis, encephalitis (to differentiate between central and peripheral pain) as well as other conditions. So far his results have been rather surprising and, in the main, favourable. However, as this material has no bearing on the present paper, its publication will be left to a later date.

Comment

1.—This method is not a cure-all. Effective though it may be it is not to be run to as a cover for an ineffective diagnosis or a cursory examination.

2.—The injection is not into the cerebrospinal

canal; it is into the vertebral (sacral) canal outside of the cerebrospinal sac.

3.—After the treatment has proved satisfactory the patient must not be finally discharged. The causal condition of the pain may appear later and may require appropriate treatment.

Conclusion

This method is very effective in giving relief in intractable (and ordinary) sciatica. In most cases it restores the patient to his occupation, and in practically all cases speedily gives marked relief from pain.

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AN UNUSUAL CASE OF ANTHRAX IN MAN

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THE lesion of anthrax in its cutaneous manifestations ordinarily presents a distinct and classical picture. Centrally, is the vesico-pustule surrounded by an acute inflammatory hyperæmic zone. By the third or fourth day, a blackish eschar appears centrally, flanked by a vesico-pustular collarette; swelling and infiltration of the invaded tissues is a pronounced characteristic of the ailment. In areas progressing to recovery the gangrenous mass sloughs. In fatal cases, it extends progressively. It will be seen at a glance that Figures I and II do not conform to this description in the skin manifestations.

Case History.—P. A., Winnipeg, a Russian Jew, seen in consultation with Dr. C. J. Bermack, November 3, 1924.

Patient's age, fifty-six. He kept a general store; in addition he bought and sold second hand paper. His supplies were purchased from the leading newspapers of the city and two of the large city hotels. We were unable to trace any infection from these sources, although we assumed his occupation had to do with the affection and that the respiratory tract was the probable portal of entry of the contagion. We were unable to determine directly any infection from the butcher shops, the abattoirs, or tanneries, either in the purchase or in the sale of the paper. We felt, however, that the symptoms suggested a disease transferable from the lower animals to man and considered that clinically glanders corresponded more closely to the published descriptions of the disease from which he suffered than did anthrax.

Mr. A— kept a horse for his deliveries; he cared for the animal himself. In our endeavour to locate the source of the trouble we had Dr. J. B. Still, chief veterinary inspector for Manitoba, test this animal. The beast was pronounced free from either glanders or anthrax. Antedating the present illness the patient suffered from auricular fibrillation with mitral involvement. He had, moreover, an enlarged prostate gland. The urine contained blood, pus, granular and hyaline casts. These complications constituted a serious handicap in combating the disease.

Present Illness.—The patient took ill October 26, 1924. Dr. Bermack was called in attendance and the patient was transferred to St. Boniface Hospital with the diagnosis of left-sided pneumonia. Three days later there was a pseudo-crisis. Twelve hours afterward, however, the right lung became involved, the temperature

again rising to 102.3°, the pulse 120, respirations 55. There was a free discharge of bloody tenaceous sputum. The skin became involved November 1st, 1924, the sixth day of the illness. At the date of my first visit, November 3rd, the eruption presented on the face, neck and dorsum of the right hand. It stopped on the scalp at the hair margin. The involved area was thickly studded with papules and vesico-pustules; occasional bullæ were noted. The lesions were discrete, rounded, tense, and ballooned out. Later they became confluent with rupture of the lesions and a free, sanguino-purulent discharge.

FIG. I.—Nov. 6th, 1924, the sixth day of the cutaneous outbreak.

Smallpox, which the lesions somewhat resembled, was excluded by the presence of vaccination scars of comparatively recent date and the localized character of the eruption. The patient had been taking potassium iodide in small amounts. Iodism was considered, but ruled out owing to the lung involvement and the constitutional symptoms of the disease. There remained in our view, as possible etiological factors, glanders and anthrax. The case presented a variant of the ordinary type of anthrax in the large number of lesions present and in their confluent character. There was no central necrosis observed at any time, in any of the sores. Further, the chronicity was at variance with the ordinary published reports of this disorder. The patient was transferred to the King George Hospital for contagious diseases November 4, 1924.

Marked thickening and infiltration of the tistues of the neck characterized the evolution of the eruption. The swelling gradually receded, however, without producing any respiratory embarrassment or difficulty in deglutination. Coincident with the reduction in the swelling and the slow absorption of the exudate, the physical condition of the patient gradually improved. Marked ectropion of the lower eyelid resulted from sub-epidermal cicitrization. See Figure II.

FIG. II.—Anthrax showing healed skin lesion with ectropion.

A considerable interval elapsed before the animal experimentation and laboratory tests definitely established the diagnosis of anthrax. Meantime, the disease gradually drifted into the chronic stage. Some hesitancy was felt as to the wisdom of using serum in view of the patient's physical condition. It was hoped moreover, that he might establish an immunity against the disorder. This he unhappily failed to do. On January 31st, 1925, Dr. Bermack administered 50 cc. anthrax serum (Lederle) intravenously. The patient stood the treatment well. A week later unfortunately he took a change for the worse. A fatal termination ensued February 10th, 1925. The bacteriological report follows:—

BACTERIOLOGICAL FINDINGS AND RESULTS OF ANIMAL INOCULATION

Nov. 6th, 1924.—Smear from face. Extracellular diplococci, and a few short streptococci. No glanders bacillus.

Nov. 7th.—Culture from face (pus). Broth; diplococci, few streptococci. Blood serum; diplococci. Culture from nose; diplococci. Smear of pus; diplococci, a few streptococci.

Nov. 8th.—Blood culture; diplococci. Culture from nose; bacillus with square cut ends, resembling *B. anthracis.* Sputum; organisms found in smear which closely resemble those found in culture from the nose.

Nov. 12th.—Guinea pig; at 12 noon, animal was injected intraperitoneally with 1 cc. of organisms from culture of nose. At 4 p.m. animal was found to be very sick, falling over to one side, and foaming at mouth. Dead at 8 p.m. Autopsy shows no lesions, but spleen much enlarged and congested. Cultures were made from pleuritic fluid, peritoneal fluid, blood, lungs, all of which gave a heavy greyish growth on agar of a gram positive spore-forming bacillus. Culture from lesion on hand; the same square ended spore-forming bacillus—anthrax (?).

Nov. 19th.—Guinea pig; 1 cc. of organisms obtained from culture of lesion on hand were injected intraperitoneally, on the 18th. Result; death. Autopsy; marked congestion of the whole peritoneal surface. Spleen very congested and enlarged. Smears and cultures were made from lung, blood, and spleen. *B. anthracis* was found in all smears, and cultures of agar and blood serum all gave growth of *B. anthracis.* Guinea pig; 1 cc. of organisms isolated from sputum were injected intraperitoneally. Result; death. Autopsy; marked inflammation of all intestines and peritoneal cavity. Spleen very congested and enlarged. Cultures taken from lung, blood, pleural fluid, spleen, growth; *B. anthracis.*

Nov. 21st.—Culture of pus from face; staphylcocci, some non-spore-forming bacilli.

Nov. 30th.—Blood culture; no growth.

Dec. 12th.—Precipitation test; positive. This test was done with organisms obtained from patient.

Dec. 20th.—Sputum; no anthrax found.

Dec. 24th.—Sputum; spore-forming bacillus, anthrax.

Jan. 1st, 1925.—Precipitation test; positive. This test was made with patient's serum and a known anthrax culture which was obtained from Dr. F. McGill, of Regina. A control test was made on serum of a healthy person at the same time. Result; no reaction. Technique used for this test is that of Ascoli.*

Jan. 4th.—Sputum; *B. anthracis* present.

Jan. 8th.—Sputum; no *anthracis* found.

Jan. 12th.—Sputum; *B. anthracis* present. This organism is spore-forming; non-motile, gram positive. Gelatin, liquefied. Loeffler's blood serum, not liquefied. Milk; acid and coagulated. Broth; pellicle formation at the top, slimy mass at the bottom, on shaking, it shows a stringy mass. Guinea pig; on Dec. 11th, 1924, animal was inoculated subcutaneously with a minute quantity of organisms, two weeks later at site of injection the tissue broke down, making a lesion about the size of a ten-cent piece, with a dark necrotic centre, which healed up in about three weeks' time. At the end of six weeks the pig was killed under ether. Autopsy; the small intestine was very inflamed, also the wall of the peritoneal cavity. Right lung congested, while on the upper surface of the upper left lobe was a hæmorrhagic spot the size of a large pea, spreading as it went through to the lower surface. Cultures from lung and spleen on agar and broth; growth, anthrax. Guinea pig. On Dec. 11th, 1924. A female pig was started to be fed on food which had been contaminated with organisms obtained by culture from Mr. P. A. For two weeks very little change was noticed in the animal, but by the end of the third week it was noticed that the pupils of the eyes were becoming dilated, and the rectum prolapsing. Fourth week; was not taking food well, losing weight, sitting in one corner of the cage with head dropped, twitching, and giving sharp squeals as though in great pain. Autopsy; marked inflammation of the small intestine and peritoneal wall. Fluid in peritoneal cavity; spleen enlarged, granular and congested; lungs congested. On left horn of the uterus was a large sloughing ulcer; the whole of this section of the uterus was very much inflamed. Cultures made from ulcer on uterus, and all affected organs gave growth of *B. anthracis.* ....

Chicken.—On Dec. 12th, 1924, the fowl was started being fed with food and water which had been contaminated with organisms obtained from Mr. P. A. Until the end of the third week no change was noticed, then it was noticed that she was inclined to fall on walking; this gradually becoming more marked by the fourth week. She did not go off her feed at any time. Killed at the end of fifth week. Autopsy; congestion of small intestine; kidneys congested; spleen enlarged; lungs congested; cultures made from all these organs in broth and agar, all giving growth of *B. anthracis.*

Jan. 16th, 1925.—Sputum; anthrax present.

Jan. 19th.—Sputum; no anthrax found.

Jan. 22nd.—Sputum; no anthrax found.

Jan. 26th.—Urine; non-motile Gram positive organism found (not pathogenic to guinea pigs). Sputum; *B. anthracis* present.

Jan. 27th.—Urine; (catheterized). Smears, show no baccilli but cocci. Cultures in broth and agar give growth of a staphylococcus.

Jan. 28th.—Sputum; no anthrax found.

Jan. 30th.—Sputum; *B. anthracis* present.

Feb. 1st.—Sputum; *B. anthracis* present. (This specimen was obtained about twelve hours after anthrax serum had been given).

Feb. 7th.—Sputum; no anthrax found.

Feb. 9th.—Blood urea; 10 milligrams urea nitrogen per 100 cc. of blood.

Feb. 10th.—Sputum; no anthrax found.

Feb. 11th.—Blood culture; staphylocci. This culture was taken six hours before death. From the outset the microscopic urinalysis showed both granular and hyaline casts, as well as a great deal of blood, the bacilli were not found until Feb. 26th and were not found again after the serum had been given.

POST MORTEM PERFORMED BY DR. W. P. McCOWAN

The post mortem was performed on February 11th, twenty-four hours after death; the body was still fairly warm, P—A— age fifty-six, an apparently old man who suffered from anthrax. He was fairly well developed but poorly nourished.

Abdomen.—Free fluid was present which was serous in nature; a swab was taken for culture; the bowel was smooth and glistening; the omentum was clear; the liver was slightly enlarged; the spleen was markedly enlarged, easily three times the normal size. Smears and cultures were made from the spleen.

Pleural Cavities.—Cultures were taken from both pleural cavities. The middle lobe of the right lung was covered with firm, fibrous adhesions; the other lobes

**Pathology and Therapeutics of the Diseases of Domestic Animals,* by Franz Hutyra and Josef Morek, vol. 1, p. 23.

were free. There were a few ounces of serous fluid in the left pleural cavity. There was no evidence of any consolidation in the lung.

Pericardial Cavity.—The fluid somewhat increased in amount; culture taken.

Heart.—Was considerably enlarged. There were numerous greyish-brown areas scattered throughout the wall (visible on the surface to the naked eye) which contained pus and cocci. The mitral valve showed numerous ulcerative areas of recent origin; the other valves were clear and apparently normal. The aorta showed some atheroma, as also did the coronary arteries.

Small Intestines.—There were a number of ulcerated areas on the small bowel in the jejunem. The ulcers were saddle-shaped, encircling the gut.

Bacteriology.—1.—Smears were made from the small abscesses on the wall of the heart: Gram positive cocci were present, which on culture, proved to be *Staphylococcus aureus.*

2.—Culture from the heart's blood showed the presence of *Staphylococcus aureus.*

3.—Smears from the lung showed Gram positive cocci.

4.—Smears from the spleen showed Gram positive cocci which on culture, showed pure *Staphylococcus aureus.* No bacilli were found in any of the above cultures or smears.

5.—Cultures from the pleural, pericardial and peritoneal cavities gave pure cultures of *Staphylococcus aureus.*

MICROSCOPIC SECTION

Heart.—Small collection of polymorphonuclear leucocytes were present in all parts of the heart muscle infiltrating the muscle and also on the surface. These varied in size from a few cells to dense collections; the heart muscle had undergone some fatty degeneration.

Liver.—Showed typical nutmeg liver.

Kidneys.—Showed evidence of arteriosclerotic change, with some acute changes superimposed.

Small Intestines.—These ulcers showed marked destruction with an acute inflammatory picture present; no evidence of tubercle.

From the above findings, one would come to the conclusion that the terminal condition here must have been a generalized infection with *Staphylococcus aureus* which was secondary to the anthrax infection. It seems certain that the serum must have sterilized the case as far as anthrax bacilli were concerned.

The Use of Physostigmin in Abdominal Distension.—The use of physostigmin in abdominal distension was studied by Hayes E. Martin and Soma Weiss, New York, in nontoxic cases in which abdominal distension followed laparotomy, surgical shock, early intestinal obstruction, or injury to the central nervous system, and in toxic cases, in which the condition was associated with peritonitis or general toxemias, such as pneumonia or longstanding intestinal obstruction. In every case various simple measures, such as gastric lavage, enemas, turpentine stupes and colonic irrigation were employed when distension occurred, and physostigmin was not used unless those measures proved ineffective, the purpose being to learn whether physostigmin is capable of relieving these patients. All the patients who received physostigmin were in a serious condition, and all manifested alarming symptoms. All of the sixteen patients embraced in the group of nontoxic cases of abdominal distension were completely relieved of this distressing symptom by the injection of physostigmin. The fifteen patients embraced in the toxic group were benefited but little or not at all. The results of these experiences indicate that the drug should be administered in doses sufficient to induce its characteristic therapeutic effect or until the occurrence of systemic actions indicates that the limits of safe dosage have been reached. Physostigmin is a useful drug for the treatment of abdominal distension in nontoxic cases, especially. It is less useful in cases of the toxic type. It has fallen into disuse mainly because of the employment of insufficient doses, partly, perhaps, because of the failure to distinguish the type of cases in which it is more effective (nontoxic type) from those in which it is less effective (toxic type). The effective dose of the salicylate or benzoate, in cases which do not yield to simple measures, is from 3 to 4 mg. (from 1-20 to 1-16 grain) injected intramuscularly. Such a dose may be repeated once after an hour if the first does not induce any systemic effects, and it may be repeated three times (at least) at intervals of three or four hours if there are no symptoms which indicate that its systemic effects persist. The general condition of the patient and his behaviour toward the drug must be observed carefully and must serve as a guide for the repetition of the dose. The dose required for those patients who respond to simple therapeutic measures, such as rectal enemas, has not been determined. — *Jour. Am. Med. Ass.*, May 9, 1925.

XUM

Case Reports

CASE OF RECENT AND OLD HÆMORRHAGES OF THE BRAIN

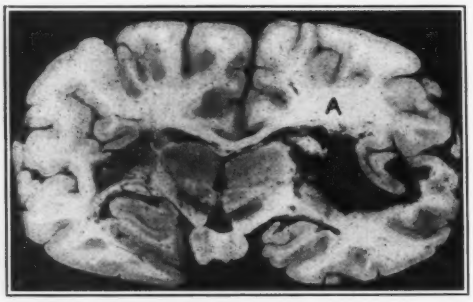
R. Gordon Douglas, M.D.

From the Pathological Laboratory of the Western Division of the Montreal General Hospital

A. B., a male, age thirty-three, was admitted to the Western Division of the Montreal General Hospital on February 20th, in the evening. He was in a state of unconsciousness, but it was found out that he had complained of a headache that afternoon. He had been able, however, to attend a hockey match the same evening, and during this he collapsed and fell unconscious, without any warning.

His personal history, as ascertained from friends, showed that he had had influenza in 1918. In 1921 he spent two months in the Hotel Dieu Hospital, being unconscious for a week, and on his discharge his left arm was weak. One sister had died of tuberculosis.

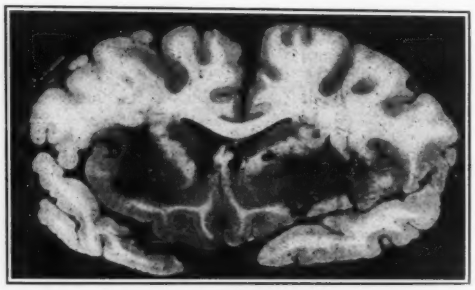
Condition on admission.—The patient appeared to be somewhat older than his stated age, was completely unconscious, with slight cyanosis, and had Cheyne-Stokes type of respiration. The left side of the body was spastic and atrophied: the right side was flaccid. Temperature was 99.5, pulse 116, respirations 28. The pulse was regular, the arterial wall was palpable, and the pressure was 220/160. The heart showed considerable enlargement, but there were no signs of valvular trouble. The lungs were clear.



Transverse section showing (A) recent large hæmorrhage on left side, with surrounding punctate hæmorrhages, (B) the posterior tip of old hæmorrhage, with some of the cyst lining, and surrounding yellow pigmentation.

Examination of the nervous system showed the right pupil to be the larger of the two; both reacted to light. The reflexes were hyperactive, except the abdominal and cremasteric, which were absent. No pathological reflexes were elicited. There was very marked spasticity of the whole left side, and on moving the left arm or leg, tremors developed on that side.

The urine was acid, sp. gr. 1015, and showed albumen and granular casts in large quantities. The cerebro-spinal fluid was under considerable tension, but was clear, and showed only eight cells per c.cm. No globulin was present. The Wassermann reaction of the spinal fluid and of the blood was negative. The blood urea nitrogen was 102 mgm. per 100 cc. and the creatinine 3.75 mgm. per 100 cc.



Section further forward, showing (B) cavity of cyst in centre of old hæmorrhage on right side.

He received hot packs, which produced profuse diaphoresis, and he was also given glucose intravenously, as well as other stimulants, but he showed no response, and died two days later, with signs of a terminal broncho-pneumonia.

The *post mortem* revealed signs of extensive cardio-renal and vascular disease. The heart was very greatly hypertrophied, and the kidneys showed a very advanced interstitial nephritis. It was in the brain, however, that the more unusual features were encountered. On opening the skull signs were found of increased intracranial pressure, as evidenced in the flattening of the surface of the brain. Transverse serial sections were made after fixation, and these showed two distinct conditions. On the left side in the region of the insula, there was a large recent hæmorrhage, and this had ruptured

into the lateral ventricle and had given rise to the urgent symptoms for which he had been admitted. Many punctate hæmorrhages were also present in this region. In the right hemisphere there were found signs of the older condition for which he had been in the Hotel Dieu four years before. This had been a hæmorrhage in the same position as on the left side, but not so extensive in nature. Cyst formation had gradually taken place in the centre of the blood clot, the cavity becoming filled with clear yellow fluid. A definite membrane had formed and outside of this was an area of yellow pigmentation in the neighbouring brain tissue; microscopically this showed old blood pigment.

The case is thought to be worthy of note on account of (1) the early age at which the first hæmorrhage took place, namely 29; (2) the recovery from this, with cyst formation; (3) the very marked degree of associated arterial degeneration.

AN UNUSUAL CASE OF ACUTE LEAD POISONING

F. W. Luney, M.D.

London

Mr. M., age fifty-eight, was admitted to the Ontario Hospital, London, in July, 1923, and was diagnosed as a case of Korsakow's psychosis without neuritis. There was a history of chronic alcoholism extending over a number of years. On admission he was found to be greatly confused, disoriented in all spheres and shrouded in fabrications. About November 1st, 1923 he was first noticed to be chewing pieces of wood bitten from the window frames. He was seldom caught in the act but the window frames in his room bore definite evidences of frequent attack. He was taken ill about November 27th with general progressive weakness and anæmia. At first his breath had a heavy sweetish odour and acetone was suspected, but no sugar was demonstrable in the urine. Large quantities of urine were passed, mostly at night. On December 8th a prominent blue-black line was noticed on the gums. The patient was more anæmic, had lost considerable weight and was extremely weak. There was, however, no sign of colic or neuritis. Urine at this time was tested for lead, but none was demonstrable. Blood examinations were made at different times showing the greatest grade of pathological change on December 13th. At this time the blood examination showed: red blood cells, 2,800.000; white blood cells, 22,000; hæmoglobin, 65 per cent; differential polymorphonuclear, 74 per cent; small lymphocytes, 19 per cent; large lymphocytes, 7 per cent.

The red blood cells were found pale, showing some variation in size and shape, extreme polychromatophilia and stippling and contained a large number of normoblasts and megaloblasts; (of 167 red cells counted, 29 were nucleated).

Routine urinalysis showed only a slight trace of albumen. The Wassermann test made during his illness was negative. After the middle of December the patient gradually improved and two months after the earliest symptoms he had fully recovered. The ward in which the patient resided had been recently painted and it was learnt from the painters that a large amount of white lead was used in the preparation of their paint.

TWILIGHT SLEEP IN OBSTETRICAL PRACTICE WITH REPORTS OF CASES

U. E. Bateson, M.D.

London, Ont.

During recent years much effort has been expended in the search for a reliable preparation which will induce painless delivery, or as it is more commonly called "twilight sleep in labour." Some success has been achieved, but there is still much room for improvement. Williams (1923) prefers morphine to heroin as it has greater analgesic power, does not diminish the intensity of the uterine contractions and has no injurious effect on the child. Lumbar anæsthesia, with 1 per cent novocain, has been employed by a few obstetricians and success has also been claimed for hypnotism, but the use of these methods did not become general and they are now seldom, if ever, used.

Various combinations of hyoscine, or scopolamine and morphine with a cardiac stimulant such as strophanthus or sparteine sulphate have been recommended. With their use the uterine contractions continue, the suffering of the patient is lessened but not abolished, a state of

forgetfulness is induced and the patient remembers little of her pain. The neurotic type of patient probably derives the greatest benefit from this treatment.

During the past year I have employed the following formula in a number of cases; morphine sulphate gr. 1/12, hyoscine hydrobromide gr. 1/200, sparteine sulphate gr. 1/3 in one capsule. This formula is wonderfully successful in alleviating the suffering of the patient, but unfortunately it causes distressing vertigo and delirium in many cases; it has also the great disadvantage of occasionally narcotizing the baby. In most cases it relaxes the os and thus aids in its dilatation. I have noticed a marked lessening of afterpains in multiparæ. The following case reports may be of interest:

Case No. I.—Mrs. A. L., aged twenty-nine, primipara, full term. Membranes ruptured at 11 p.m. Pains began at 1 a.m. and were sharp but irregular. At 10 a.m. there was only slight dilatation of the os, and the patient was nervous. I gave the twilight sleep formula mentioned above and in a short time the patient calmed down and went to sleep. At 4.30 p.m. the os was fully dilated and the head was pressing on the perineum; I then gave pituitrin 0.5 cc. which had little effect. Delivery was completed with low forceps at 5.45 p.m. There was no asphyxiation of the baby; the mother did not remember her labour pains but complained very much of vertigo and delirium.

Case No. II.—Mrs. S. P., aged twenty-one, primipara, full term. Membranes ruptured at 5.30 p.m. At 9 p.m. os was dilated two fingers. Pains were sharp and moderately severe. Gave twilight sleep formula. Patient slept soundly for several hours, but talked irrationally at times and afterwards complained of vertigo. I received a hurried call at 5 a.m. and found the baby born and crying lustily, while the mother still slept.

Case No. III.—Mrs. C. B., aged twenty-four, second pregnancy, full term. Membranes ruptured on Sunday at 11 a.m. No labour pains, but discharge of liquor amnii continued at intervals until Wednesday morning when pains started. At 1.30 p.m. os was dilated three fingers; pains regular, but not strong. Patient very nervous. Gave twilight sleep formula which was followed by the usual vertigo, delirium, sleep and forgetfulness of pain. At 4.30 p.m. os was fully dilated and pains regular. I gave pituitrin 0.5 c.c. at 5 p.m. and baby was born at 5.30. It was not narcotized.

Case No. IV.—Mrs. A. T. M., aged thirty-three, full term. Labour pains, which began at 10 a.m., occurred irregularly during the day. At 4.30 p.m. os was dilated three fingers but was thin and very tense, there was no liquor amnii present. Gave twilight sleep formula. I was called again at 6.45 p.m. and found vertex appearing at vulva. Baby was born at 7.20. Baby was severely narcotized and was resuscitated with difficulty. Mother slept for two hours after birth of the baby, but complained of vertigo and talked irrationally. Says she felt as though she was having a good big drunk.

A CASE OF DUODENAL ULCER

G. W. A. Aitken, M.D.

London, Ont.

Male; age forty years; when first seen complained of nausea and loss of appetite, with vomiting several times a day of brownish material, the colour of coffee grounds; sour and bitter; the pain in the epigastrium was relieved by the vomiting; also by taking food, or lying down. He suffered also from a sensation of weakness and a definite loss of weight. The above condition had existed for the past three weeks, but he gave a history of having had similar attacks off and on during the last twelve years. These attacks appeared to be becoming worse. Definite pain usually commenced about four or five o'clock in the afternoon; during the early part of present attack, he felt pain also under the left scapula, and across the back.

The examination was negative except for the abdominal signs. There was an area of marked tenderness about two inches in diameter just above and to the right of the umbilicus, associated with slight tenderness throughout the rest of the abdomen. No swellings were found. The liver and gall-bladder appeared normal. A clinical diagnosis of duodenal ulcer was made.

X-ray report.—Special gall-bladder plates were negative for gall-stones. Examination of the stomach after the barium meal shows that the stomach is very large, dilated and atonic. The barium meal did not pass through the pylorus into the duodenum, and at the end of six hours there was 100 per cent retention of the meal in the stomach. *Diagnosis.*—Obstruction at the pylorus probably due to contracting duodenal ulcer.

Treatment.—Patient was put to bed. Sippy diet as follows was prescribed: 3 oz. each hour, mixture of cream and equal parts of milk beginning at 7 a.m. with the last meal at 7 p.m. Not having calcium carbonate or calcined magnesia at hand, he was given a mixture containing ten grains of sodium bicarbonate with one drachm of milk of magnesia, every hour commencing at 7.30 a.m. and continuing until the last feeding at 7 p.m. after which five doses were given half an hour apart.

Progress record.—The pain, nausea and vomiting ceased within twenty-four hours. After two days the previous mixture was changed to powders of following composition: powder No. 1, heavy calcined magnesia grs. 10, sodium bicarbonate grs. 10. Powder No. 2, calcium carbonate grs. 10, sodium bicarbonate grs. 30. One of these powders was given alternately every hour. Diet was also increased according to the Sippy régime. Three weeks later the patient was again x-rayed. *X-ray report*: The radiographic examination of the stomach shows that it fills normally, but there was a decided hesitation before it begins to empty. The duodenal cap is deformed, indicating a contracting duodenal ulcer. At the end of five hours there still remains 30 per cent of the barium meal in the stomach. This shows marked improvement from the last examination.

Patient was becoming very tired of taking frequent meals and powders and was now put on three meals a day with lunches at 10 a.m. and 3 p.m., and a liquid mixture after each meal and lunch and at bedtime containing in each dose, bismuth subcarbonate, grs. 6; sodium bicarbonate, grs. 16; Tr. belladonna, minim. 2; milk of magnesia, one drachm. Improvement was rapid, patient gained weight and strength and was discharged in seven weeks feeling well. Since then patient has had occasional sensations of discomfort in the epigastrium, but these have cleared up in a few days under treatment.

Physical Allergy.—W. W. Duke, Kansas City, Mo., summarizes his paper as follows: The symptoms bronchial asthma, vasomotor rhinitis and conjunctivitis, photophobia, abdominal pain, erythema, pruritis, urticaria, angioneurotic edema, eczema and shock can be caused in some patient specifically and solely by the action of a physical agent, such as light, heat, cold, mechanical irritation, freezing and burns and, in the case of heat sensitiveness, indirectly by mental and physical exertion. As a rule, symptoms are caused specifically by one physical agent only, although occasionally by two or more. Patients sensitive to material substances, such as pollen, animal hair and food, rarely react specifically to the action of physical agents, and vice versa. The condition seems the commonest single cause of the symptoms mentioned in the group of cases wheih give negative skin tests to pollen, animal hair and other material substances. Heat and cold are the more common causes of reaction and, of these, heat is a more common cause than cold. For this type of disease, the name "physical allergy" "allergy caused by physical agencies) is used. It is not assumed, however, that physical allergy is identically the same disease as allergy caused by material substances, such as pollen and animal hair, although it is believed that they are closely related. Four important types of reaction were observed: first, local or contact reactions, confined to the area directly exposed to the physical agent; second, shock reactions when large areas of skin were exposed in contact cases; third, reflex-like reactions which might involve the areas directly exposed and distant structures as well, and fourth, solitary reactions. Several possible explanations for the condition might be offered. One which seems likely is based on an assumption that patients with allergic tendencies might become specifically hypersensitive to some new body formed in the tissues solely under the influence of one physical agent. Another explanation worthy of consideration is based on an assumption that under certain abnormal conditions a protein molecule might be broken down under the influence of a physical agent, with the liberation of a hystamin-like body, and that this causes the reaction. Testing with the physical agents mentioned and treatment carried out along logical lines with physical agents are useful in the specific diagnosis and specific treatment of the allergic symptoms mentioned.—*Jour. Am. Med. Ass.*, March 7, 1925.

XUM

Association Notes

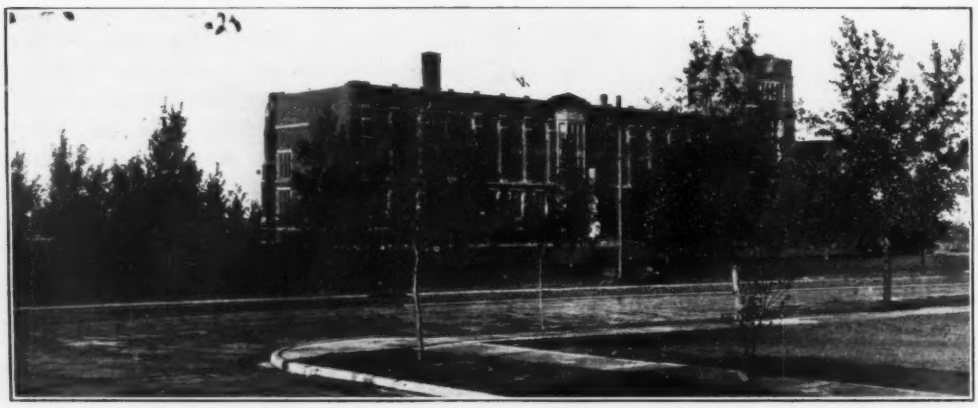
THE CONVENTION CITY

REGINA, which has been chosen as the meeting place of our Association for 1925, may appear to many of the profession living in our more eastern and longer settled provinces as but a young and ambitious stripling. Less than forty-five years ago this now flourishing and important city, the capital of the Province of Saskatchewan did not exist. A few straggling tents and wooden shacks on the border of Wascana Lake, then known as Pile o' Bones Lake, were the only indications of the small settlement on the site of the present busy city of nearly 40,000 inhabitants. These early settlers were the vanguard of hundreds of sturdy pioneers who soon began to follow the then almost unbroken trails leading through the prairies of the Great West. To these gradually increasing groups of intrepid men and women facing danger and hardship on the wind-swept plains of Saskatchewan and Alberta in the early 'eighties came the iron-road builders of the Canadian Pacific Railway; and with the installation of easy and rapid transit, business took a leap forward, farms were multiplied, wealth poured in and the brown tents and uncouth shacks began to give place to well built dwellings.

Recent as has been all western Canadian history, Regina has from the beginning been regarded as an important centre, and as the capital of the old North West Territories it features prominently in the Riel Rebellion and other Indian disturbances, and was early made the headquarters of that able and well officered organization, the Royal North West Mounted Police. Even after the sub-division of the North West Territory into provinces and the amalgamation of that body with the Dominion police under the name of the "Royal Canadian Mounted Police," Regina still remained the western headquarters and the training ground for the new recruits.

Although the development of the city has been very rapid the visitor will see no sign of mushroom growth but will be impressed by the architecture and appearance of stability in its public and private buildings.

Regina is the centre of a rich and extensive agricultural territory, a territory which for fertility has few equals and is adequately served by twelve railway lines radiating from the city. It is one of the largest distributing centres in Canada for farm machinery and a visit to the wholesale section where the distributing warehouses are located will well repay the stranger. It is also important industrially,



REGINA COLLEGE

LEGISLATIVE BUILDING, COMPLETED IN 1913

being the most active manufacturing centre between Winnipeg and Calgary, and in this respect is making great strides every year. The 1918 census gives the city a total of nearly 120 industrial and manufacturing establishments. The product of these various industries in 1923 had a value of over twenty million dollars.

Regina is justly proud of its public buildings, colleges, school, churches, and the buildings of the Provincial Parliament which stand in a park covering 160 acres. Its Parliamentary Library contains the oak table brought from Quebec around which the Fathers of Confederation sat while framing the act in 1884. Although the city was planted in a comparatively treeless district its parks now are of remarkable beauty, with a profusion of verdure, and the clean orderly streets are thickly lined with many varieties of shade trees.

When Regina was chosen as the meeting place for our Association we were but adding another to the list of important conventions which had already been held in the Saskatchewan capital. On account of its central location and its railway connections with both east and west, north and south, as well as the enthusiasm and hospitality of its

LOOKING TOWARD THE CITY FROM THE PARLIAMENT BUILDINGS; SHOWING ITALIAN GARDEN AND PART OF GROUNDS

citizens, Regina has well earned the name of the Convention City of the West. Sport lovers may be sure of finding opportunities to indulge in their favorite pastime whether it be boating, bathing, riding, tennis, bowling, or golfing. There are two excellent golf links each with eighteen holes and both within easy distance of the city. Sportsmen will be surprised at the quantity and quality of its wild fowl, while in the more northern timber limits larger game abound.

In the month of our meeting a trip through the surrounding wheat belt should prove a delightful experience, the emerald fields stretching away beyond the limits of vision in every direction. The Province of Saskatchewan in 1923 produced 250,000,000 bushels of wheat, more than half the total produced in all Canada. Its live stock industry is rapidly increasing in importance and its pure bred stock has a name for excellence.

A practically complete programme follows. It is unnecessary to emphasize its many new and interesting features. As a final word to the profession throughout Canada east and west the Regina executive states that the whole city has put forth its best effort to ensure a successful meeting and are looking forward confidently to a very full attendance.

Regina is a city well worth a visit at any time, but in June next, it will have a double attraction for medical men when it entertains the Canadian Medical Association, and there can be no doubt that Saskatchewan's capital will entertain royally, and will delight in extending a whole-hearted welcome to all convention visitors.

OFFICE BUILDING, WITH VICTORIA PARK IN FOREGROUND

CANADIAN MEDICAL CONVENTION, REGINA, SASK.

JUNE 22 - 23 - 24 - 25 - 26, 1925

Programme

Monday, June 22nd.

9 a.m. to 12.30 noon.

Meeting of Canadian Medical Association Council.

12.30 noon: Luncheon with President Elect.

1.30 p.m. to 5 p.m.

Canadian Medical Association Council.

6.30 p.m.

Members of Council guests of the Regina and District Medical Association.

Tuesday, June 23rd.

9 a.m. to 12.30 noon.

Meeting of Canadian Medical Association Council.

12.30 noon.

Luncheon—combined—Consisting of Members of the Canadian and the Saskatchewan Medical Associations and Ladies, together with the members of the Women's and Men's Canadian Clubs.

2 p.m. to 5. p.m.

Business Meeting of the Saskatchewan Medical Association.

6.30 p.m.

Saskatchewan Round Table Dinner followed by an Impromptu Conference.

Wednesday, June 24th.

10 a.m. to 11. a.m.

Official Opening.
Address: Dr. J. F. Kidd.
Installation of new President. Dr. D. Low.
Address of welcome by Premier Dunning and Mayor Mason.

SCIENTIFIC PROGRAMME

11 a.m. to 11.45 a.m.

Dr. L. J. Austin, Kingston. Pathology and Treatment of Gallstones.
Dr. Oertel leading in discussion.

11.45 a.m. to 12.30 noon.

Dr. Perry Goldsmith, Toronto. Inflammation of the Middle Ear and Complications that may arise.

12.30 noon: Luncheon with Rotary Club.

Speaker: Dr. T. C. Routley.

2.15 p.m. to 3. p.m.

Mr. Carson, London, England. Surgical Treatment of Gastric and Duodenal Ulcer.
Sir Henry Gray, leader of discussion.

3 p.m. to 3.45 p.m.

Dr. D. MacKenzie, Montreal. Mechanical Factors in Renal Infection.

3.45 p.m. to 4.30 p.m.

Dr. A. T. Bazin, Montreal. Lung Abscess—a Survey of Treatment.

3 p.m. to 6 p.m.

Gymkhana by the Royal Mounted Police at the Mounted Police Barracks.

7 p.m: Annual Dinner.

Thursday, June 25th.

8.30 a.m. to 9.15 a.m.

Dr. Roscoe Graham, Toronto. Differential Diagnosis and Management of Upper Abdominal Disease.

9.15 a.m. to 10. a.m.

Dr. C. H. Hunter, Winnipeg. Psychotherapy and the General Practitioner.

10 a.m. to 10.45 a.m.

Dr. Alexander Primrose, Toronto. Gastric Surgery.

10.45 a.m. to 11.30 a.m.

Dr. A. J. Picini, Chicago. Nature of Physiotherapy.

11.30 a.m. to 12.15 noon.

Dr. J. S. Pritchard, Battle Creek. Etiology of Cough.

12.30 noon: Luncheon with Kiwanis Club.
Speaker: Dr. L. J. Austin.

2 p.m. to 2.45 p.m.

Dr. J. C. Fitzgerald, Toronto. Recent Advances in Public Health.

2.45 p.m. to 3.15 p.m.

Dr. John Amyot, Ottawa. Relation of the Profession to the Public.

3.15 p.m. to 4. p.m.

Dr. D. A. Stewart, Ninette; Dr. J. S. Pritchard, Ninette. Enteritis as a Complication in Pulmonary Tuberculosis.

4.30 p.m. to 6. p.m.

Garden Party, Government House.

6 p.m. Separate Alumni Dinner.

8.15 p.m. Public Meeting.
Chairman, Dr. D. Low, Regina.
Speakers: Dr John Amyot.
Hon. Dr. J. M. Uhrich.

12.15 to 12.30 p.m.

Annual Meeting Canadian Medical Protective Association.

Meetings of the Western Branch British Medical Association and Canadian Radiological Society have also been arranged.

Friday, June 26th.

8.30 a.m. to 9.15 a.m.

Mr. Carson, London, England. Cancer of the Colon.

9.15 a.m. to 10. a.m.

Dr. G. E. Richards, Toronto. Radium and X-Ray in the Management of Breast Carcinoma.

10 a.m. to 10.45 a.m.

Dr. W. T. Connell, Kingston. Points in the Prognosis of Cardiac Disease.

XUM

10.45 a. m. to 11.30 a.m.
Dr. F. L. McKinnon, Winnipeg. "Bipp" in the Treatment of Osteomyelitis.

11.30 a.m. to 12.15 noon.
Dr. W. A. Lincoln, Calgary. Pyelitis.

12.30 noon. Luncheon with Gyro Club.
Speaker: Dr. J. S. Pritchard, Battle Creek.

2 p.m. to 3. p.m.
Dr. Alan Brown, Toronto. Children's Clinic.

3.15 p.m. to 4. p.m.
Dr. Ellice McDonald, Philadelphia. The Mechanism of Disease.

4 p.m. to 4.45 p.m.
Dr. H. S. Sharpe, Brandon. Backache.

4.45 p.m. to 5.15 p.m.
Dr. Helen McMurchy, Ottawa. Maternal Mortality

LADIES' PROGRAMME

Tuesday.

12.30 noon. Combined Canadian Club Luncheon.
Reception at the home of Mrs. S. E. Moore, 3078 Angus Street.

Wednesday.

Reception at the home of Mrs. David Low, 1929 Scarth Street.
3. p.m. to 6. p.m. Gymkhana by the Royal Mounted Police at the Mounted Police Barracks.
Afternoon Tea at Mrs. T. A. Morrison's, Barracks Square.
High Tea and Bridge at the Parliament Buildings.

Thursday.

Noon. Luncheon with Women's Canadian Club.
Garden Party at the Government House.
Public Meeting.

Friday.

Drive around city, following which the Ladies' Committee will give a tea at the home of Mrs. Hugh MacLean, 2930 Albert Street.

HOTEL RATES

King's Hotel (*American plan*)

Single Room, $4.00—Single Bed.
Double Room, $4.50—1 Person.
Double Room, $8.00—2 Persons.
Double Room and Bath, $5.50—1 Person.
Double Room and Bath, $10.00—2 Persons.
Double Room, 2 beds, $4.50—2 Persons.
Double Room, 2 beds, $4.00 each—3 or 4 Persons.
Double Room and Bath, 2 beds, $5.00 each—2 Persons.
Double Room and Bath, 2 beds, $4.50 each—4 Persons.

Kitchener Hotel (*American plan*)

Single Room, without Bath—$4.50
Double Room, without Bath—$8.00.
Single Room, with Bath—$5.50.
Double Room, with Bath—$9.00.
Number of Rooms, 75.

Wascana Hotel (*European plan*)

Fourteen on First Floor with Bath—$2.50 Single—$4.00 Double.
Nine on Second Floor, 2 Public Baths—$2.00 Single—$3.00 Double.
Five on Second Floor (2 beds in each room)—$2.00 Single—$3.00 Double.
Six on Third Floor—$1.50 Single—$2.50 Double.
Eight on Third Floor—(2 beds in each room)—$1.50 Single—$2.50 Double.
Capacity, 110.

Champs Hotel (*European plan*)

Running Water in all Rooms, two baths on each floor.
Single Rooms—$2.00 per Day.
Double Rooms—$3.00 per Day.
80 Rooms.

Several other good hotels. Requests for reservations to be addressed to:—

DR. M. R. BOW,
Local Secretary,
c/o General Hospital, Regina. Sask.

Morphine Before and After Operations.—A questionnaire sent out by M. A. Slocum, Pittsburgh, on the use of morphine before and after operations leads to the following conclusions: The surgical profession is distinctly not in accord regarding the use of morphine before and after operations. The reasons given, by surgeons in general, for not using morphine differ widely. It is a curious fact that one group of prominent men condemns morphine as definitely producing unfavourable symptoms, while another group advocates its use because it prevents these very symptoms. This questionnaire clearly establishes the fact that a majority of surgeons are in favour of morphine preoperatively and postoperatively in practically all cases. At the present time, there is less fear of using morphine in surgery than there was twenty years ago. Whether this should be a danger signal or whether it has come about because of advances in knowledge remains to be proved. An attempt should be made to set some sort of standard by which we can be guided in our use of morphine. While it is admitted that it is difficult to standardize the use of drugs in general, it is felt that morphine is of sufficient importance, and in general enough use in surgery, to merit at least a trial toward standardization. There seems to exist a vast field for research, animal and otherwise, in the therapeutics of morphine. It is true that there is a great deal known about the pharmacology of morphine. However, there is little mention in the literature of work done on animals regarding the effects of morphine on the kidneys, circulation, gastro-intestinal tract and respirations.—*Jour. Am. Med. Ass.*, April 25, 1925.

Retrospect

THE LIFE CYCLE OF PEPTIC ULCERS*

L. C. Montgomery, M.D.

Montreal

In the April number of the *Archives of Internal Medicine,* Drs. Burril B. Crohn, Samuel Wieskopf and Paul Aschner present an interesting study on the life cycle of the peptic ulcer both gastric and duodenal.

The authors begin their article by reminding us that in spite of years of intensive clinical study of the etiology, pathology, course and effects of treatment of chronic peptic ulcer, many points are still open for discussion. The recent contributions of roentgenologists have tended to show that under favourable circumstances many ulcers tend to disappear and presumably to heal. The disappearance of the roentgenographic niche is the criterion on which such a judgment is founded.

In addition, the operation of subtotal gastrectomy for the radical removal of ulcer, has as the writers state, delivered into our hands fresh specimens of various types at various stages in the life cycle of the peptic ulcer.

The authors undertook their studies with a view to re-examining the subject of the life history of ulcer, particularly from the standpoint of the healing of such a process after conservative medical or after surgical treatment. They were particularly interested in the problem of what happens to a peptic ulceration in the stage of an intermission of symptoms. Do ulcers ever heal spontaneously? Does an ulcer heal temporarily and partially when the patient enters a period of freedom from symptoms and the niche disappears? How often is such a healing process a durable and lasting one, and what are the pathological stages in such a restitution to integrity? What are the conditions incident to the recurrence of ulcer? And finally, to what extent do the usual surgical procedures vouchsafe a lasting prevention of the original or of new ulcers?

*Read at a meeting of the McGill Medical Reporting Society, May, 1925.

From a review of the literature, these authors consider that one fact stands unchallenged, and that is, that ulcers can and do heal. Stewart, at the Leeds General Infirmary, for the years 1910-1921 states that the "healing of a gastric and duodenal ulcer is a common event." His statistics show that in the post mortem room, scarring in the stomach is encountered almost as frequently as ulceration, while duodenal scars occur with about half the frequency of duodenal ulcers. Hart in Germany found in general necropsy material that from 8 to 13 per cent of adult bodies carry either open ulcerations or scars of healed ulcers, the scars and the ulcers occurring with about equal frequency. Aschoff also corroborates these findings.

The authors had for their study approximately seventy specimens, each specimen consisting of the distal one-third or one-half of the stomach and adjoining first portion of the duodenum, including the ulcer itself.

The first point taken up was *the pathology of a gastric ulcer compared with its clinical history.* From a study of two groups of specimens they were led to believe that ulcers may form rapidly, probably within two or three weeks, and, having by that time achieved a given size, no longer extend their circumference. They react only by an increase in protective connective tissue in the periphery and in the depths. This also would agree with the idea that perforation as well as hæmorrhage usually are observed in cases with a history of only a few days or weeks, namely, in the stage of rapid penetration. A far smaller percentage of chronic indurated ulcers of long standing gives rise to sudden perforation with peritonitis.

The largest ulcer seen was 1.5 by 3.5 cm. in area, which occurred in a man whose history was that of one year of continuous, severe, gastric complaints without intermission. They considered it important to note that ulcers with continuous symptoms are larger, deeper, and more dangerous that those in which attacks alternate with free intervals. It is possible that in the intermission period a sufficient re-

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parative process often takes place to prevent an extension of the pathological ulceration.

There was also a group in which the history was one of years, but in which long periods of freedom from pain were followed by shorter spaces of periodic activity of the ulcer. These ulcers were small, usually 0.5 cm. by 0.5 cm. in area, superficial, and apparently had a firm connective tissue bed. These were ulcers showing a tendency to slow cicatrization.

The final group of specimens showed an hour-glass deformity of the stomach. These specimens had a history of from one to twenty years. The sequence of events in these cases is as follows: an open indurated ulcer perforates the viscus, and the base of the ulcer is formed by a neighbouring organ, usually the liver. The ulcer is now unable to contract and heal because its base is fixed and unyielding. The productive reaction on the part of the ulcer results only in a thick callous ulcer with connective tissue strands infiltrating the serosa and encircling the viscus giving rise to biocular deformity. In every case there is evidence of distinct and continued tendency to heal resulting only in more deformity and a failure to fill the crater with granulations.

The second point taken up was *the pathology of duodenal ulcers compared with their clinical course.* They consider that duodenal ulcers have more of a tendency to be cast in one mould. Most of those seen in specimens removed at operation were smaller than the average gastric ulcer, about 0.5 by 1 cm. in area, rather shallow, with the muscularis as a base, and showing little tendency to productive cicatricial repair. In one case with the shortest history, four months, a fully developed ulcer was noted.

In the cases in which the intervals in the history had been longer than the periods of pain, a heaping up of inflammatory scar tissue could be distinctly seen. The largest ulcers were those in which the recent course, or the course from the onset, had been the most severe and the most continuous. Secondary diverticulum formation was very common. The authors considered it to be a pulsion diverticulum, which occurred between the site of the ulcer and the pyloric sphincter. It was present in every fourth or fifth specimen removed at operation. In nearly all instances, although there was a distinct, persistent loss of the continuity of the surface mucosa, there was also undoubted evidence of connective tissue repair taking place, with contracture of the walls of the ulcer, both in depth and in circumference.

A group of seven cases of duodenal ulcer were studied, which at the time of operation showed that the ulcer had healed, pathologically speaking, or almost healed. The operative indications had been clear cut. Most of these were cases in which a severe hæmorrhage had occurred a few weeks previously. A modified Sippy diet was administered during the weeks following the hæmorrhage. When the specimens were removed at operation, the remains of the ulcer could usually be identified only as a small scar or a puckered area with regenerated mucous membrane. The authors remind us that following a hæmorrhage, gastric symptoms usually cease for a longer or shorter period. The duration of the clinical symptoms did not seem to be of great significance, for some of the cases were of five years or more in duration. The attacks, however, alternated with long periods of relief from symptoms. The tendency of gastric ulcers to heal after hæmorrhage is in the author's opinion, much less marked. Specimens of gastric ulcer removed after hæmorrhage still showed evidence of erosion of the bleeding vessel in the base of the ulcer; little in the nature of reparative reaction was visible.

They attempt to explain the contradictory facts of duodenal ulcers showing a definite tendency to heal, and yet having given rise to a severe hæmorrhage, by the hypothesis, that ulcers heal readily in the intermission period, only to break down during the next attack in fresh ulceration. It is in this phenomenon, they consider, lies the explanation of what occurs in the intermission stage of the clinical history of ulcer, a tendency to heal followed by a reopening of the same or possibly of an entirely new ulcer forming during the next attack; another phase of healing and another recurrence of the ulceration. In some cases, final healing must take place else one could not explain the post mortem discovery of gastric and duodenal scars. This phase of healing and re-ulceration is seen in the healing of an ulcer after gastroenterostomy, and in the not at all infrequent recurrence of the same ulcer or of a new one months or years after the apparent surgical cure.

Observations on reparative processes in peptic

ulcer.—The authors assume that the characteristic features of an ulcer are the result of two opposing influences. (1) The causative, destructive factors which continue to operate, and (2) the protective reaction of the organism, the reparative factors. It would appear from this that the histological appearance of any ulcer at the time of its removal would depend on which of these two influences was in the ascendant. Specimens of approximately seventy-three partial gastrectomies were examined to determine first the histological features of reparative processes and second, the frequency of their predominance. In thirty-four specimens of gastric ulcer there was no specimen in which healing was predominant. In thirty-nine specimens of duodenal ulcer, however, eight showed convincing microscopic evidence of predominating reparative processes. The active ulcers showed essentially the same lesions as the gastric specimens.

Roentgenographic evidence of course of peptic ulcer judged by disappearance of niche.—Twenty cases were under continual observation for from two to three years. The authors consider that in general it may be said that the disappearance of a visible roentgenographic niche, as a sign of penetrating ulcer, runs parallel with the clinical improvement in the course of the case, just as reappearance of the Roentgen-ray evidence of the penetration occurs simultaneously with the recurrence of active symptoms. They are not prepared to say whether the disappearing penetration means a fully healed ulcer, a scar, or merely a filling of its crater with granulation tissue as a temporary stage towards the healing process.

In the cases studied the niche disappeared completely in ten cases and partially in two additonal cases. In eight of the twenty cases, neither the niche nor the clinical symptoms were beneficially affected by the course of treatment. (The treatment being rest in bed, alkalis and a modified Sippy diet).

The shorter the duration of symptoms at the time medical treatment was begun the better seemed to be the result. On the other hand, the impression was gained that cases with long standing histories gave less favourable results. Those with long intermissions between attacks seemed to heal most readily.

The behaviour of peptic ulcer in the stomach which has been operated upon.—The writers agree that peptic ulcers do heal after simple gastro-enterostomy, but remind us that the percentage which do so is still a much mooted question. Various reports range from 30 to 90 per cent. Years after operation the ulcer may recur, or we may have a gastro-jejunal ulcer formed. In a group of three of the authors' cases, gastro-enterostomy had been performed for gastric or duodenal ulcer. Following this expedient, renewed symptoms required laparotomy. At this second operation, the original ulcer (lesser curvature of stomach or duodenum) was seen to be entirely healed, but a gastro-jejunal ulcer had formed. As the original ulcer had healed, the gastro-enterostomy was undone, and the original condition restored. Some time subsequently, a renewal of severe symptoms led to a third laparotomy at which time it was noted in all three cases that the primary ulcer had recurred, and in the identical site.

These examples would seem to show that even though an ulcer is apparently well healed after a gastro-enterostomy, a return to normal condition again brings into play the factors that had created and will again create the original ulcer.

Subtotal gastrectomy, the authors state, removes the ulcer-bearing area of the mucosa of the stomach and the first portion of the duodenum, and leaves an anacidity permanently established in the remainder of the organ.

Extent of Drug Addiction.—It will be of interest in this connection that, according to the study made by Kolb and Du Mez (published in the May 23, 1924, issue of the United States Public Health Reports), the number of addicts in the United States has decreased steadily since 1900 and that the maximum number in the country at the present time is estimated at 150,000. This is a figure far below the alarmist statements which are frequently circulated.—New York Academy of Medicine: Public Health Committee Report, 1924.

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Editorial

ON THE INDUSTRIAL WORKER

IN a recent brochure written by Louis I. Dublin, statistician of the Metropolitan Life Insurance Company, the health of industrial workers is discussed. The statements made in this pamphlet are sufficiently important to demand the consideration of the medical profession generally. Dublin affirms in the first place that the longevity of industrial workers is distinctly less than that of those who are engaged in other forms of employment. So far as can be estimated from statistics collected regarding the 5,000,000 men insured in this Company, the expectation of life at the age of twenty years for healthy men engaged in industrial pursuits, is forty-two years; that is, on an average such men will attain the age of sixty-two years. On the other hand, men of similar age and condition not engaged in industrial work may expect to live fifty years. There is, therefore, a difference of about eight years in the average expectation of life between those who are engaged in industrial works and those who are not so engaged. This handicap of eight years in the expectation of life is in the nature of a tax which the millions of workmen engaged in industry throughout the country pay under present conditions.

Possibly more important, but less easily measured, is the tax of illness and disability laid upon men who are engaged in industry. A study made a few years ago by officers of the Metropolitan on the amount of sickness prevailing among the policy holders found the average loss of working time for industrial workers to be eight days *per annum*. Dr. Dublin states that his impression is that the actual loss is a good deal heavier than that, since much illness goes unrecorded. With our present knowledge it is impossible to state how this amount of eight days *per annum* compares with the rate of illness prevailing in the general population, or with those who make their living otherwise than by industrial work.

This limitation of the life of industrial workers is of importance to the State as well as to the worker himself. It will, therefore, be interesting to discuss the several causes which may account for this reduction in the expectation of life among the many millions engaged in industry. Some of these causes are quite obvious, others much less so. The extra hazard from accident is important. At the present time over 2,000 workmen are killed each year in occupation accidents in New York State. Dublin estimates that these accidents decrease the life span of all workers about one year on the average.

Tuberculosis is even more important than accidents. Dublin states that for years he has held the opinion that industrial employment is probably the most important single factor in the tuberculosis death rate. The problem of controlling tuberculosis is to-day largely concentrated among the industrial classes. Age period for age period, the death rates are from two to three times as high in the class of industrials as in those who are not industrial. Heredity and other innate differences may play some part, but in his opinion they account only in a very minor degree for the disparity in the mortality of the two classes. The death rate from pneumonia is twice as high among industrials as among non-industrial workers and it may, therefore, be considered as an added occupational hazard. Possibly the loss in life expectation resulting from this cause is as great as that from industrial accidents. Further research, however, is necessary before we can speak definitely on the relation between industry and the development of pneumonia.

The degenerative diseases such as cerebral hæmorrhage, Bright's disease, and organic heart disease, show strikingly the effects of industrial exposure. In addi-

tion to these factors in industrial work which favour illness and shorten life there are the special hazards attending certain industrial processes which Dr. Henderson referred to in his paper in a recent issue. Because of this increased liability to sickness, accident, and death Governments in all enlightened communities have established State Departments of Labour under which a controlling oversight is maintained over the hygienic conditions existing in industrial plants and workshops. Notwithstanding this governmental oversight the first and most important influence in the removal of this handicap on labour must come from the medical profession. Unfortunately at the present, industrial disease and hazards as such, are not sufficiently recognized by the profession as a whole, and Dr. Dublin insists on the necessity for the details of industrial hygiene being given a more important place in the *curriculum* of the various medical schools than it holds at present.

Next to the education of the medical profession is the education of the workers themselves. Much can be accomplished through organizations such as Dr. Cannon has described in our present issue. Information regarding the hazards of individual industries should be distributed as widely as possible throughout these industries. The State Department of Labour can well afford to supply all groups of workers with qualified speakers and with pamphlets giving general instructions and information on the specific hazards of each industry.

The employer likewise has a most important part to play in this new field of industrial hygiene. He is vitally concerned in the problem because it is to his interest to have his employees keep well. His profits depend on continuity of employment, and in the smooth running of his plant, and he should therefore be willing to cooperate with State officers, and open his factory for inspection when such investigations are made by competent persons. The value of industrial hygiene should be recognized by both employer and employed. This recognition as has been proved in several of the industrial establishments in Canada will result in better industrial relations between the management and the men employed; in decreased periods of illness; in better work turned out; in diminished labour turnover; and in countless other ways. In all of these the medical officer must play a most important part.

THE PSYCHOLOGY OF THE MINER

THROUGHOUT American and certainly throughout the English coal mines there is very great discontent among all those who do the mining, and any industrial psychologist who offers constructive suggestions as to how to make the conditions of their work less uncongenial places not only the local community but national industries which depend upon the mining industry deeply in his debt. An article appears in the *English Review* to which the "*Lancet*", March 28, 1925, calls attention, in which Mr. James A. Bowie seeks to account for the bellicose mental condition which appears to have developed in recent years among workers in the industry. He points out that from 1904 to 1913 the percentage of the total workers in the coal industry who were involved in disputes entailing loss of work was 21.4. Next to these came the textile industry with only 6.4 per cent, while the mean average of all other trade groups was only 4.4. Since the armistice matters have been worse, and in 1922 and in 1923 the local disputes lost to the country and to the miners over 1,250,000 working days. Yet during these two years there was less unemployment in this industry than in any other.

Although coal mining must for a variety of reasons such as lack of sunlight, risk of accident, be regarded as an unpleasant occupation, it is not, comparatively speaking, an unhealthy one. The mortality rate has been falling steadily;

while in gold mining countries silicosis takes a heavy toll, in coal mining it is different. Although the alleged prevalence of this illness has been under consideration by a committee of the House of Commons, it is stated that the evidence so far presented to the committee is insufficient to justify any recommendation to compensation.

The fear of silicosis therefore can scarcely be regarded as a factor conducive to discontent, and judging from statistics supplied to the House of Commons in last February, mining disasters have been fewer in number and have claimed fewer victims.

According to Professor Collis mortality records vary widely in different coal fields. During a period of about thirty years, the mortality rates for Lancashire and South Wales have been nearly double those for Nottingham and Derbyshire. Collis points out that on recent occasions when ballots of the miners have been taken, the greatest amount of discontent has been revealed in these two districts—Lancashire and South Wales.

With these statements before us Mr. Bowie suggests that a mental 'dungeon complex' comparable to the prison complex of factory hands is present in the sub-conscious minds of those who toil in darkness amid dirt and dust. He gains support for this argument from the existence among coal miners of the disease nystagmus, which is peculiar to them. This disease prevails chiefly in poorly illuminated pits and is recognized by the profession as due to a definite neurasthenic condition. As coal mines are steadily being deepened danger from mine gases increases; the use of safety lamps which give less illumination than naked lights has therefore been greatly on the increase. Mr. Bowie thinks that the solution of the problems existent in the miner's psychology may possibly be found closely associated with the cause of miner's nystagmus, and that the provision of better illumination in our coal mines would seem to be a simpler expedient than many of the proposals which are put forward today.

THE INFLUENCE OF CEREAL FOODS AS A FACTOR IN RICKETS

THE Medical Research Council of Great Britain has just issued a report by Professor Edward Mellanby, on the effect of cereals and their interaction with other articles of diet and environment in producing rickets. He observes in his introduction that probably in no physiological activity so far studied do action and reaction of dietetic elements stand out more prominently than in the growth and hardening of bone. The various common cereals—oatmeal, whole wheat flour, white flour, barley, etc.—have different effects on the growing animal; differences which cannot as yet be explained on the basis of their known constituents. Experiments indicate that some cereals and cereal products have a strongly adverse influence on bone calcification, and this influence may be varied not only by the amount and type of the cereal eaten, but by the general make-up of the diet. The cereal action can be completely antagonized by the anti-rachitic vitamine present in cod liver oil; also to some extent by exposing either the animal or the cereal food to ultra-violet radiation. Recent investigations have been carried out in the laboratory in order to find the substances in cereals which interfere with the calcification of bone and the proper functioning of other tissues. The task has proved more difficult than at first thought for its solution does not appear to depend upon any well recognized dietetic factor or factors. Although the research is still incomplete Professor Mellanby reports the progress made up to the present for three reasons. One is the practical importance in dietetics of the facts so far observed. The second is because they put into better perspective the significance of the phosphorus and calcium ele-

ments of the diet in the etiology of rickets. The third is the emphasis they give to the great importance of balance in dietary constituents, on account of "the constant battle going on among dietetic elements as regards the calcification of bone, some substances stimulating and others preventing the process."

With a diet deficient in anti-rachitic vitamines increasing the amount of cereal, brings about worse formed bones, if the other factors of diet and environment remain constant. Of the different cereals examined, oatmeal contrary to what might be supposed, has by far the worst influence on bone formation. Next come maize, barley, rice and wheaten flour, the last having the least harmful effect. Of the food stuffs containing the anti-rachitic vitamine which antagonizes cereal action, cod liver oil is by far the most effective. Whole milk in fairly large amount and egg yolk are also potent antagonists, but butter unless accompanied by a fairly high calcium intake is of comparatively small value. Even when the diet is very deficient in anti-rachitic vitamine the development of rickets may be hindered to some extent by increasing the calcium content by the addition of the carbonate. In conclusion Professor Mellanby touches briefly on two practical points. One is the question why, if oatmeal is so detrimental to bone formation, fine races of men have been reared on diets in which this cereal forms a large part? The other is, what is the bearing of these experiments upon the use of whole meal *versus* white bread? In answer to the first question Mellanby suggests that the diet of the oatmeal-eating people has also included a large amount of foods rich in the anti-rachitic vitamine, such as milk, eggs, and fat fish. In tropical countries where cereals form a large part of the diet, sunlight has an important influence in antagonizing the cereal effect. As regards the controversy about the advantages possessed by whole wheat bread, Mellanby is of the opinion that the question has little importance in the problems relating to the production of rickets.

INFLUENCES AFFECTING LACTATION

FOR many years dairymen who were suppliers of milk to the large cities were concerned chiefly with the amount of milk furnished by the several breeds of cows and the amount of fat which the milk of each contained. Very recently, however, the profession has become aware that there are other things to be considered in connection with milk destined for the feeding of young infants besides its chemical composition, and even its purity. In an article which appeared in the *Journal of Bio-Chemistry*, 1924, vol. xviii, p. 716, Dr. Ethel M. Luce makes the statement that milk from the same cow, while apparently retaining the same elementary composition may vary greatly in its growth-promoting and anti-rachitic value. A cow's diet must contain a proper amount of green fodder rich in vitamines, if it is to maintain its growth-stimulating value. It must also have sunlight if its anti-rachitic value is to be maintained. The milk yield of cows deprived of vitamines in their diet very soon becomes unsatisfactory for an infant's food especially if such cows are kept in poorly lit stalls. The most desirable milk for the purpose of infant feeding is obtained from cows kept on pasture in which the grass is fresh and green. Experiments would show that the ill effects from improper diet and lack of sunlight may to some extent be counteracted by the administration of cod liver oil. This variation in these important properties of cows' milk may be a contributory cause of the seasonal incidence of rickets.

It is impossible to study these modern investigations on lactation in the domestic animals without feeling convinced of the importance of a properly arranged diet in the case of lactating

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mothers. It is essential that their diet should contain a full amount of vitamines; the mother also should have the benefit of all the sunlight possible especially during the winter months. The occasional appearance of rickets in breast fed infants would appear to bear witness to the importance of these precautions. In the case of older children it should be remembered that it has been shown that although summer butter may have a vitamine potency, this potency is slight and seldom exceeds one hundredth of the potency of first quality cod liver oil.

Holmes has also pointed out that even though an infant may be specially fortunate as regards its vitamine body reserve at birth, this reserve cannot compensate for a vitamine deficiency in its diet for more than a short period of its growth; as milk forms the large portion and often the whole of the infant's diet the vitamine content of the milk is of extreme importance, and this holds true not only of cows' milk but of breast milk.

INCREASE OF THE ANTI-RACHITIC POWER BY IRRADIATION OF MILK AND OTHER FOODS

THE value of the ultra-violet light as a specific therapeutic agent has during the last few years been definitely placed upon a firm basis, and heliotherapy or actino-therapy promises to assume an important position in the physician's armamentarium. Only during the past few years has the efficacy of cod liver oil in the treatment of rickets been evidenced by demonstrations of its activity afforded by the x-ray. Still more recently, has it been shown that light and cod liver oil have a similar action in promoting growth and stimulating calcification in rickets. The two processes of growth and bone calcification in young animals are apparently intimately connected, and Professor Mellanby has emphasized the fact that an adequate supply of fat soluble vitamine in the blood is essential if animals are to grow normally and to have their bones normally calcified. During the past few weeks two important papers have been published, one on the irradiation of milk and the healing of rickets, (*British Medical Journal*, March 28, 1925) by Dr. Cowell of the Royal Infirmary in Sheffield, and the other on Irradiated Foods by Drs. Steinbock and Daniels, which appears in the *Journal of the American Medical Association*, April 11, 1925. From them we quote in the preparation of this article. In 1922 Hume and Goldblatt and Soames of the Lister Institute made the interesting observation that the growth of rats, when placed on a ration deficient in vitamine A, would continue if they were exposed to the radiations of the quartz mercury vapor lamp. Later on, these investigators showed that livers taken from rats exposed to such radiations, when fed to other rats were able to stimulate growth, while livers taken from non-irradiated rats were inactive. Drs. Steinbock and Daniels about this time were experimenting on a colony of rats in an endeavour to test the comparative amount of vitamine A and the anti-rachitic factor which existed in butter fat and cod liver oil. In their experiments groups of their animals were exposed to ultra-violet irradiations, while other groups were not; but in order that the environment of both groups should be the same, both irradiated and non-irradiated animals were kept in the same cage. It was a surprise to the investigators to find that both irradiated and non-irradiated animals all grew alike. In one case however in which the irradiated animals were only put into a cage with non-irradiated rats five weeks after the experiment had been started, it was found that the non-irradiated animals which had been showing lack of growth started at once to grow after the introduction of the irradiated animals. Drs. Steinbock and Daniels considered that as the Eng-

lish investigators had obtained a stimulation of growth in their animals from feeding livers from irradiated rats, these livers after irradiation must contain the anti-rachitic factor. As the livers of non-irradiated rats had proved quite inactive, they supposed that the ultra-violet light either synthesized the anti-rachitic factor or brought about its translocation from other organs, fresh experiments were therefore undertaken. Two groups of rats were fed, one with a ration containing grain, casein and salt which had had no irradiation; the second group was fed with the same ration exposed for thirty minutes to the radiations of the quartz mercury vapor lamp. Much surprise was occasioned when it was found that rats fed with irradiated material grew rapidly while those getting the untreated material were entirely unaffected. Evidently the food material had been altered in some way by the irradiation. It was then assumed that possibly cod liver oil owed its anti-rachitic activity to solar radiation, probably through the consumption by the cod of fishes living in shallow waters which in turn subsist on plankton living in the same environment. It was assumed that if cod liver oil owed its activity to light such activity ought to be permanent Nevertheless it was found that cod liver oil if illuminated excessively may lose its activity completely, showing that the active ingredient is not entirely stable. It was proved, however, that cod liver oil can be saponified under heat without losing its anti-rachitic potency. Experiments indicate also that almost all oils if fresh can be activated; attempts to activate old or rancid oils has thus far resulted in failure. The number of food materials that can be made anti-rachitic by simply exposing them to light is far from limited It is a property found in foods of both plant and animal origin, but is not universal. Such diverse materials as wheat, Indian corn, cream of wheat, crude casein, shredded wheat biscuits, meat, milk, egg yolk, butter and liver may be successfully irradiated.

When it was found that irradiated animals put into the same cages with non-irradiated animals were able to influence the growth and calcification of the bones of the latter, it was thought that the irradiated animals gave off secondary invisible radiations as the result of their exposure to the light, for it has been shown that cod liver oil and other anti-rachitic agents give off radiations when oxidized, but it has not yet been shown that these radiations are anti-rachitic in action.

The fact that light can impart anti-rachitic properties to certain compounds furnishes an explanation as to how light acts directly on the body and may exert the same action in preventing rickets as cod liver oil taken by the mouth. When light acts directly on the body it evidently exerts potency by activating anti-rachitically certain substances already present in the body. This anti-rachitic action consists in promoting calcium assimilation and its conservation for the animal, a matter which concerns not only the young but also the adult. These findings may have significance not only in nutrition, but also in the therapy of diseases known to respond to irradiation with ultra-violet light.

LOCKE ON THE UPBRINGING OF CHILDREN

A LARGE audience gathered in the rooms of the Royal Society of Medicine, in London, to hear Dr. Hector Cameron expound the views of Locke the philosopher on the upbringing of children. The *Lancet*, March 21st, 1925, in an editorial gives us an epitome of his address. Locke is chiefly known to us in the present day by his philosophical and political achievements, but few of us have known that he was an active member of the medical profession. In the intervals of writing metaphysical treatises, restoring the finances of Great

Britain after the great revolution, taking a prominent part in the foundation of the Bank of England, instituting reforms in the administration of the poor law, and assisting in the framing of the constitution of the State of Carolina, Locke found time to conduct a successful general practice. That he was no mean surgeon is shown by his treatment of that "imposthume in the breast" from which Pepys records Lord Ashley to have suffered in June, 1668. "He hath been fain to be cut into the body" remarks Pepys, and it was Locke who undertook this operation, sterilizing the skin by free application of the cautery, and evacuating what we now know as a hydatid cyst through a silver tube. Locke also turned his attention to the problem of the upbringing of children, and wrote a book on the subject which went through twelve editions in some fifty years. He recognized several kinds of those crying babies who render night hideous, the neighbours furious, and the doting parents distraught. Crying, he observed, was of several sorts, but the worst of all was the "stomachful cry"; a purposive cry with a deliberate attempt to disturb and distress the parent. Almost invariably the parents of such a child are particularly susceptible to the disturbing effects of such crying. It is remarkable how quickly a child divines the weak point in its mother's armour, and then seems impelled to keep on exploiting that discovery like the insane patient who appears forced to wound those whom he most loves and depends upon.

For excessive corporal punishment Locke had little use. Children are susceptible earlier than we think to praise and commendation, and much may be done to mould them to the parents' will by a consistent attitude of pleasure or displeasure according as the conduct is right or wrong. Corporal punishment should only be administered when the child offers a challenge; the obstinate cry should by no means be permitted; least of all should a hasty correction be allowed to end in obstinate bawling, for then the good of the punishment will be all undone. Chastisement, says Locke, should be delivered calmly and with an observation of its effect upon the mind, and brought to an immediate close when the child has been rendered pliant. To put their bodies in pain without doing their minds any good is cruelty rather than correction. Locke had also something to say about the difficult school-boy, who, in the oft-repeated words of the school report, "could do better", lacked concentration, and would not attend. He pointed out that some boys were idle through sheer love of idleness, but with many others the more they were appealed to or threatened the more lamentable was their performance. It was difficult for any boy to learn when pressed by any strong emotion; especially by fear. Dr. Cameron illustrated Locke's point by relating how a surgeon had brought his boy to him one day with a sheaf of poor reports, Cameron suggested to the father that perhaps a similar regime to that of the school might be introduced at his hospital. The governors might summon him periodically to the board room, intimate that they were dissatisfied with his work, that the weekly lists of operation results showed his name invariably lower than that of his colleagues, that his marks for asepsis were consistently poor, and, as a final suggestion, that he might go to the hospital on Saturday afternoon and do fifty hernias as an incentive to future effort. The parable worked its effect, and the father left the room with a broadened outlook.

ICONOGRAPHY OF ANDREAS VESALIUS

IN 1914 the University of Brussels initiated a movement to celebrate the quartercentenary of the birth of Andreas Vesalius, and a committee was formed to carry out the plan. It was intended that this celebration should take form in the publication of a '*liber memorialis*' comprising a collection of essays to be

contributed by a group of selected scholars, the best authorities on their several subjects. The late Sir William Osler was greatly interested in this memorial, and took an active part in its preparation. Mr. M. H. Spielmann, well known as an authority and writer on Art, was invited to undertake the preparation of an Iconography of Vesalius which was to be complete in every respect and form a lasting memorial to the great anatomist. This part of the work was just completed when the great war arose, putting an end to all arrangements for carrying out the celebration. It has recently been arranged that this iconography should see the light; it is to be published in its complete form by the Wellcome Historical Medical Museum as the third volume of the research studies in Medical History issued by that institution. Forewords will be contributed by Professor Paul Heger of the University of Brussels, Sir Arthur Keith, Professor Harvey Cushing, and Dr. Tricot-Royer, President of the International Society of the History of Medicine. All historical, bibliographical, biographical, and critical points connected with the life of Vesalius are detailed. The book will be illustrated by over a hundred reproductions from paintings, pictures, engravings, sculptures and medals, and present also a full bibliography of the subject. The work will be published probably in May and will be offered for sale by John Bale, Sons and Danielsson of London.

SMALLPOX AND VACCINATION

UNDER the auspices of the League of Nations many foreign public health officers during last month have been visiting selected centres in England to inspect the national and municipal health organizations in Great Britain. An instructive visit terminated about the middle of March, and its close was marked by a luncheon given by the Government, at which Dr. Horst, the representative of Holland, in reply to a toast, acknowledged the pioneer part played by Great Britain in the organization of health departments and in the many health activities which were being carried on in every district, but he raised a smile among the visiting health officers by expressing surprise that in this pioneer country, it appeared that little regard was paid to the value of vaccination. It would appear that this belittling of the value of vaccination is taking place in many countries, due in part to the fact that the type of smallpox prevalent during the past few years has been of a mild character, and in part to the prejudiced statements of fanatical opponents to vaccination and medical progress generally.

Among the leaders in a campaign recently started to further a recognition of the value, not only to man but also to the lower animals themselves, of scientific medicine, founded as it is on humanely conducted animal experimentation, the name of the venerable Dr. W. W. Keen of Philadelphia is conspicuous. In a recent number of the *Saturday Evening Post*, there appears an account by him of epidemics of smallpox which might have been prevented by vaccination. He describes the loss of life in the American Army from smallpox during the Civil War; he relates the main facts of the Montreal epidemic in 1885 in which over 3000 people died from the disease in ten months; and submits figures from health statistics in Germany and the Philippine Islands proving conclusively the value of vaccination; and concludes his article with the statement that smallpox in any civilized community is a disgrace. In another article which appears in the "*Survey*" it is emphasized that the number of cases of smallpox in any community is a direct index of the degree to which vaccination is preached and practised in that community. Massachusetts reported for 1923 a smallpox rate of 0.1 per 100,000 of population, whereas Montana

had a rate of 110. among the same number of people.

Unfortunately there appears to be an indifference to the necessity for vaccination in many of our provinces. We regret to note the epidemic of eighty-three cases which has occurred in Vancouver, and which has led to a modified isolation of that city by its neighbours to the South. We congratulate this city, however, on the effective steps which have been taken by its public health officer to stop the epidemic.

The last *Statistical Bulletin* of the Metropolitan Life Insurance Company calls attention to the fact that the character of the smallpox prevailing during the past year was distinctly more virulent than that which occurred during the preceding three years. The Windsor epidemic of 1924, of which we published an account in a preceding issue was of an extremely virulent type and the percentage of deaths reported was many times greater than has occurred in any epidemic for many years past. At the present the smallpox menace is not confined to any particular section of North America. It must be emphasized that with neglect of vaccination the disease will flourish, and the efficiency of our transportation system makes it possible to scatter far and wide the seeds of a severe, devastating epidemic. Prevention of the disease through vaccination and re-vaccination is therefore a matter for nation-wide concern. No community can afford to have even the appearance of an epidemic

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COCAINE ADDICTION

AT a recent meeting of the Society for the Study of Inebriety, Professor W. E. Dixon opened a discussion on cocaine addiction. He spoke first of the well established use of the drug among the Indians of South America, where it was used as a stimulant and narcotic. Chewing cocoa leaves enables them to travel far without hunger or fatigue. Since it is known that the injection of cocaine gives no pleasure, it is thought that the alkaloid perhaps does not represent the entire action of the fresh leaves.

The action of cocaine on the nervous system corresponds with a stimulation of the entire cerebral cortex. This may be demonstrated experimentally. Atropine and caffeine have a somewhat similar action, but their action is more regular and dependable The stimulation of cocaine on the central nervous system is uncertain and variable When the nervous centres are mildly stimulated hyperactivity develops but stronger stimulation may cause sudden collapse with paralysis of the nervous centres and death in those susceptible to this drug. Arresting the circulation by means of ligature or by the addition of adrenal n to the cocaine, checks its absorption, prevents the drug's action on the central nervous system and permits its destruction in the tissues. Little systemic action is noticeable even though the circulation is restored after half an hour. This is one of the reasons for administering adrenalin along with cocaine in local anæsthesia. If, however, cocaine and adrenalin are both suddenly absorbed into the general circulation the toxicity of the former is increased by a synergistic action between the two.

Cocaine is much more dangerous when given in concentrated solution (ten to twenty per cent.) than when given in dilute solution; in a weak solution the tissue colloids take up (adsorb) the drug to a greater extent and thus render it comparatively harmless. Man is said to develop a tolerance to cocaine peculiar to himself, but the manner is not yet clear. (This belief has recently been contradicted.—*Editor*).

Professor Dixon reviewed the question of addiction to cocaine. He stated that an increasing tendency toward an illegitimate use of the drug, especially in America, was noticeable before the war or the establishment of prohibition; perhaps

post-war conditions have aggravated the situation. Cocaine taking is less prevalent in Europe than in the East or in America. According to a Congressional Commission, in 1919, about four per thousand of the adult population of the United States indulged in narcotics. In France there are signs that drug addiction is diminishing and it should not be supposed that all those using cocaine powders are necessarily drug addicts. Professor Dixon thinks that cocaine takers are a public menace and should be treated in the same way as we treat typhoid patients and those ill with other infectious diseases; namely, by isolation and removal of the drug. Cocaine addiction is the worst of all drug habits since the mental, moral, and physical deterioration are so rapid. The prognosis, however, is better for the cocaine habitué than for the morphine addict. Complete and sudden withdrawal may easily be effected without injury, while in severe cases of heroin or morphine addiction such a procedure may possibly result in death. It is easier to cure those who, as a result of disease, have contracted the habit, than those who have been led into it by some preexisting mental condition. Professor Dixon does not agree with the view held by the special police commission in New York in charge of narcotic work, who consider the problem of the cocaine habitué as belonging to the class of criminal cases, because ninety-eight per cent. of such cases, were associated with crime; this view recalls the mediæval methods of dealing with lunatics. Professor Dixon, in the place of such action, would suggest (1) the prosecution of cocaine traffickers, (2) some form of international control of the production and manufacture of the drug such as seems to be possible from the deliberations of the League of Nations, (3) spreading among medical men and students and teachers information concerning the gravity and danger of the habit. H. G. MacDermot

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Localized Gangrene Following the Hypodermic Administration of Calcium Chlorid.—On the basis of the work of Walters, M. G. Seelig, St. Louis, began the use of calcium chlorid as a part of the preoperative preparation in all cases of obstructive jaundice. As far as could be determined, the drug accomplished all that Walters claimed for it. The resident surgeon of the hospital began using the calcium chlorid therapy for lowering the clotting time in conditions other than obstructive jaundice, and reported most gratifying results. After the drug had been used for about a year and a half, Seelig was asked to see a seventeen year old girl on whom a tonsillectomy had been performed a week previously. As she was known to have a very long clotting time, she had received three intravenous injections of 10 per cent. calcium chlorid before operation. After the administration of the last injection, her clotting time, which had been eleven minutes, was lowered to one and one-half minutes. After the third injection, the complained of discomfort at the site of injection. This was followed by redness, swelling and other signs of cellulitis, and finally ended in two ugly-looking gangrenous sloughs that required about eight weeks to heal. Inquiry failed to disclose that there had been any particular technical difficulty in making the intravenous injections, although the interne believed it quite possible that some of the solution may have been injected into the subcutaneous tissue when the third dose was administered. Calcium chlorid, administered intravenously, in strengths above 1 per cent., is not an innocuous drug. Solutions of 2 per cent. and over show a marked tendency to cause necrosis and gangrene when brought into contact with subcutaneous tissue. When solutions of such strength are used for intravenous administration, necrosis and gangrene constitute a very real menace, because of the danger of some of the solution escaping into the perivenous tissues. The poisonous effect of calcium chlorid (marked cardiac depression) may be discounted in a large enough measure because the dosage commonly used is not large enough to cause toxic symptoms, particularly if the solution is administered slowly. The administration of a 1 per cent. solution (50 cc. administered slowly) seems to be a very certain protective against all undesirable effects.—*Jour. A.M.A.*, May 9, 1925.

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Editorial Comments

ON DRUG ADDICTION IN THE STATES

We consider that the statement made in the discussion at the meeting for the Study of Inebriety by Professor Dixon which we publish in this issue on the amount of drug addiction existing in the United States requires comment. It is not fair to mention the statement of the U. S. Treasury Department Survey to which reference is made, when the results of the investigation by a Congressional Commission are mentioned, without giving equal acknowledgment to a similar investigation conducted by the U. S. Public Health Service. In the latter this sentence occurs: "It follows that the trend of addiction was upward until about the year 1900, when it took a downward course which it has maintained up to the present time (1924)." A careful survey made indicates that the number of drug addicts is nothing like 4 per thousand of the adult population, or even higher as some alarmist writers have stated. A total of 110,000 in a population of 103,000,000 is apparently a close estimate of the actual extent of drug addiction at present, while in 1900 it is estimated that there might have been as many as 264,000. This refers to drug addiction in general. So far as cocaine is concerned, figures given by the public health report show that if *all* the cocaine imported into the United States between 1908 and 1914 were used by addicts, only 18,334 individuals could have been supplied; between 1915 and 1923 the number could have been only 12,276. Obviously the actual number must be much smaller. The report states further, that "cocaine hydrochloride was used alone by a large number of addicts prior to 1915, but is now used only in conjunction with opiates except in a few cases." Such data do not support Professor Dixon's implication that there is an increasing tendency toward cocaine addiction either as a result of the war or prohibition.

R. L. STEHLE

JEWISH UNIVERSITY ON MOUNT SCOPUS

The medical world will be interested in the new Hebrew university which has recently been opened by Lord Balfour on Mount Scopus in the vicinity of Jerusalem. The foundation stones of the new university were laid in 1918, and designs of the buildings themselves were drawn by Professor Geddes and Mr. Mears. It is proposed that the university start as a research centre primarily with a view to promoting an intellectual atmosphere, and the achievement of a high level of scholarship. The medical department was founded in the spring of 1921, and a research laboratory for microbiology is now almost completed. An x-ray, therapeutic, and diagnostic institute is also now well equipped, and the American Jewish Physicians Committee is now engaged in the collection of funds for the erection of a modern university hospital. As soon as the necessary amount has been collected the committee hope to erect a medical college with modern laboratories attached. The committee also hope to institute at an early date visiting lectureships in the various branches of medicine and surgery to be held by the leading medical teachers of Europe and America. A Jewish National Library is also in process of organization in which already there are 250,000 cards in the catalogue. Many books have been presented by the various European Governments, by the British Museum, and by the New York Public Library. The university will be open to students of all creeds, races and nationalities.

At the recent Washington meeting of the American Surgical Association, Dr. Archibald, Professor of Surgery, McGill University, was elected one of the two vice-presidents of that association, the other being Dr. Judd, of the Mayo Clinic at Rochester. Dr. Archibald was also elected president of the American Association for Thoracic Surgery.

"WHEN divines arrive at certainty in their schemes of divinity; or lawyers in those of law; or politicians in those of civil government; the physicians will do it likewise in the methods and practice of physic."

—Sir William Temple

Abstracts from Current Literature

MEDICINE

Arterial Hypotension. Barach, Joseph, *Archives of Internal Medicine,* February, 1925.

The author, in his article, presents for consideration some observations on low blood pressure, both in health and disease. For the sake of uniformity he adopted the level of 110 mm. of mercury or less as indicating arterial hypotension.

His first study deals with the frequency of hypotension in health. In 1914, a study was made of 656 students. In this series twenty-three cases showed a systolic pressure between 110 and 100 mm. of mercury, and seven cases had a systolic pressure beween 100 and 90 mm. of mercury, an incidence of 4 per cent. In 1918, out of a group of 1,315 recruits, there were seventy-three cases of pure arterial hypotension. In another series, out 1,016 recruits, twenty-four were rejected on account of hypotension. At the Carnegie Institute of Technology in 1923, out of 100 freshmen, fifteen had a systolic pressure of less than 110 mm. of mercury. Here an incidence of about 2.5 per cent is noted.

The body weight of these hypotension patients was considerably less than those of the other men. The average chest expansion was 2.9 inches for the former as compared with 3.1 inches for the normal. The hypotension cases were also found to have a smaller chest capacity. Also that they displayed a marked inefficiency for arduous and sustained physical effort. Their vital capacity was as a rule below the average. They were individuals of the hyposthenic and asthenic build.

The author's second study deals with hypotension in disease. He takes up the acute infections first. In a study of eighty-one cases of typhoid fever, hypotension was found present from beginning to end, reaching its lowest level in the fourth week of the disease. As convalescence progressed, pressure returned to normal. In fifty cases of influenza, the average systolic pressure was 89 mm. of mercury and the diastolic pressure 53 mm. of mercury. In uncomplicated cases, the pressure continued falling during the first, second and third day of the disease, and began rising on the fourth day. In acute infections of the upper respiratory tract, when a patient complains of muscle pains, chilliness, cold hands, cold feet and shivering, with a normal or subnormal temperature, one will find a temporary hypotension. In pneumonia there is practically always a marked fall in blood pressure. In the above acute infections there is a tendency to cyanosis, showing that there exists incidence of a respiratory deficit, and, therefore, a want of oxygen.

Of the chronic diseases, pulmonary tuberculosis is usually accompanied by a very marked degree of arterial hypotension. The degree of hypotension is proportional to the extent and severity of the disease. Respiratory deficit and arterial hypotension go hand in hand. In Addison's disease, hypotension is said to be most marked. In diabetes, hypotension occurs in those cases in which there has been great loss of flesh and strength, and in which there is an accompanying weakness. Hypothyroidism constitutes another group usually characterized by hypotension. In chronic respiratory diseases, such as tuberculosis, the patient's respiratory deficit comes from consolidated lung and muscular weakness, both reducing pulmonary ventilation. In anæmia, the oxygen carrying power of the blood is deficient. In hypothyroidism, the oxygen consumption is diminished.

A third group of 100 cases in which arterial hypotension constituted the most marked abnormality, was studied. These were called essential hypotension. Taken as a group, the subjects were distinctly undersized. They were non-athletic. They had narrow nostrils, and frequently nasal obstructions. They had narrow chests and slender bodies. They belonged to the hyposthenic and asthenic type. They had a smaller than normal chest capacity, and showed a marked tendency to muscular relaxation. Frequently they had drooping shoulders and were shallow breathers.

In a fourth group of forty-six patients ranging from sixty to ninety years of age, there were five whose systolic blood pressure did not exceed 110 mms. of mercury. The author had some of these under observation for years,

and noted the blood pressure recede from year to year with the advancing atrophy of muscle and subcutaneous tissues. He believes that in these, the oxidative process runs on an economic basis, and that this, in part, accounts for their longevity.

All the evidence, when correlated, seems to point significantly to the deduction, that when there is a respiratory deficit and decreased oxidation, then we find arterial hypotension.

L. C. MONTGOMERY

Ulcerative Bronchitis due to Vincent's Organisms. Jackson, C., *Jour. Am. Med. Assoc.*, 1924, vol. lxxxiii, p. 1845.

Two cases of pseudomembranous bronchitis due to Vincent's organisms (both the bacillus and the spirillum) are reported. The first patient, a woman of eighteen, had ulceration and membrane of the tonsils which cleared up in a few weeks after treatment with tincture of iodine, silver nitrate, and other agents. She then did not completely gain her health and had fever as high, on some occasions, as 101°. A cough with offensive sputum, sometimes blood-tinged, developed. On physical examination there was some dullness at both bases and a variety of râles were heard. With the bronchoscope ulceration of the bronchial mucosa on both sides was seen and pus and shreds of whitish material came away on the sponges used. In these the organisms were found. Twenty per cent silver nitrate was applied on six occasions at weekly intervals and complete recovery resulted.

In the second patient, a man of twenty-two, the diagnosis of aspirated foreign body had been made. There were signs suggesting abscess of the lower left lobe, but on bronchoscopic examination no foreign body was seen. The left bronchus was occluded with whitish material which came away in tube-shaped casts leaving an ulcerated mucous membrane and quite a quantity of pus was aspirated. Other organisms were found but the predominating organisms were Vincent's bacilli and spirilla. This patient was lost sight of for six months. He had gone to sea and stated that the cough and sputum had ceased after a month. Chevalier Jackson thinks, in view of these two cases, that it would be wise to exclude the presence of Vincent's infection in every case of suppuration of the lung. In his opinion the aspiration of the pus was more important than the endobronchial medication.

ARCHIBALD MALLOCH

The Comparative Value of Blood Transfusion and Blood Tonics in Secondary Anæmias. Janes, M. L., *Am. Journ. of Med. Sci.*, April, 1925.

Dr. Janes reminds us of recent observations on the circulation of the blood in bone marrow which help to explain the mechanism underlying the appearance of the red cells in the blood stream. The delivery of the red cells to the blood, in the absence of bone-marrow disintegration, is controlled by the growth pressure of the developing erythrocytes: "....Thus, after a single large hæmorrhage immature corpuscles appear in the circulation as soon as the growth pressure of the stimulation erythropoietic areas exceeds the pressure of the surrounding bone marrow, but it is possible that after repeated hæmorrhage a stage of adjustment may be reached where the immature forms do not appear in the blood following further hæmorrhage."

Now the demand of the body for iron is easily understood when it is remembered how continual is the destruction of the red cells; it has been calculated that the life of the red cell is about six weeks, and that about 7,000,000 die about every second; and it is these cells that contain (in the form of hæmoglobin) about 95 per cent of the entire iron in the body. But it has been affirmed that inorganic iron in the form of Blaud's pills, and arsenic in the form of Fowler's solution, has little or no effect on blood regeneration without proper diets, and therefore it must not be assumed that inorganic iron is of value in the treatment of simple anæmia (Whipple, Hooper and Robisheit). Dr. Janes has undertaken experiments to determine whether this conclusion held good in secondary anæmias in general; also to make comparisons between the effects of inorganic iron and arsenic preparations administered for thirty days, and repeated blood transfusions, each of 500 cc., at ten-day intervals for an equal period of time.

Ten patients in all were studied, both young and middle-aged, and of both sexes. Iron was used in various standard forms, such as Blaud's pills, Basham's mixture, saccharated ferrous

iodide, etc., and the findings show that the administration of these produced an average gain in hæmoglobin of five per cent, and a gain of 200,000 red cells, an increase so small as to be within the margin of error in calculations. Blood transfusions, on the other hand, caused an average increase in the hæmoglobin of 21 per cent, and 800,000 in the red cells, with decided general improvement. H. E. MACDERMOT

PÆDIATRICS

Enlarged Thymus as a Cause of Cyanosis in Newborn Infants. Evans, E. T., *Surg., Gyn. and Obst.*, October, 1924.

Newborn infants who develop cyanosis, whether constant or intermittent in attacks, are often suffering from enlargement of the thymus gland. The breathing is often obstructive in type. Nursing is difficult. Broncho-pneumonia, intra-cranial hæmorrhage and malformation of the heart should be considered in the diagnosis.

The x-ray plate may show no thymic enlargement—but it is the antero-posterior thickness and the weight of the thymus, not the width which causes pressure symptoms.

Such infants even *in extremis* should be given the benefit of x-ray or radium therapy. Cessation of symptoms following x-ray treatment is a more reliable criterion of diagnosis than a "positive" x-ray picture. Relief occurs in a few hours. The treatment is apparently without danger. L. M. LINDSAY

The Treatment of Pneumonias in Children with the Blood and Serum of Chickens. Berger, H. C. and Montgomery, J. C., *Arch. of Int. Med.*, December, 1924.

There is present in normal chicken serum a protective substance against the pneumococcus of types 1, 2, and 3. The chicken is tolerant of large doses of pneumococci when given intraperitoneally with no untoward results. Clinical experience showed that in both broncho-pneumonia and lobar pneumonia in children the mortality can be greatly reduced by the use of chicken blood or serum in addition to the usual methods of treatment—moreover convalescence is greatly shortened.

The fresher the serum and the earlier it is administered the greater is its efficiency. The dosage, too, is of some importance. Whole blood was abandoned for serum because the latter was found safer, easier to administer and larger doses could be given intravenously. The results showed great possibilities and warrant further study of this method of treatment. L. M. LINDSAY

An Epidemic of "Glandular Fever" in a Preparatory School for Boys. Guthie, C. C. and Pessel, J. E., *Med. Jour. of Dis. of Children*, April, 1925.

In the autumn of 1922 there occurred 300 cases of a peculiar acute disease in a boys' school having some 500 students, affecting principally the younger members of the student body.

The disease was characterized by definite symptoms and signs; a prodromal period of two or three days with headache and sore throat: an abrupt onset of chilly sensations, headache, sore throat, malaise, prostration and a rapid rise in temperature to 101° or even 103°. The fever usually subsided gradually in three to five days, the defervescence being accompanied by drowsiness and followed by a sense of well-being. The throat presented a dry, coarsely granular appearance of the pharynx with only moderate swelling of the tonsils. No rash was seen in any case, nor pain in the back and limbs as occurs in grippe; anorexia and constipation were present. About nine per cent of the cases showed a peculiar dry granular conjunctivitis of one eye, not associated with lacrimation or purulent exudate. Almost all bed patients showed a readily palpable spleen, and some a palpable and tender liver. The superficial lymph nodes, especially the posterior cervicals, became smaller during the febrile period and somewhat tender. Symptoms suggestive of enlargement of the thoracic and abdominal glands were present in a few cases. The blood showed a polymorphonuclear leucocytosis as high as 15,000 during the febrile period, followed by a relative lymphocytosis while the glands remained swollen. None of the cases showed any complications other than a faint febrile albuminuria for a few days. Smears and blood cultures were negative, and biopsy on a gland was not done.

The authors discuss the differential diagnosis for acute upper respiratory infections, Hodgkin's disease, acute leukæmia and dengue, and conclude that they were dealing with a disease

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corresponding closely to the published descriptions of glandular fever. R. R. STRUTHERS

SURGERY

Perirenal Hydronephrosis. Lipshutz, Benjamin, *Annals of Surgery*, vol. lxxxi, page 502.

From a clinical viewpoint perirenal hydronephrosis and solitary cyst of the kidney are in every way alike. The problem of differentiation is one of etiology and histology. Regarding solitary cyst, it may be said that any part of either kidney may be involved. The wall of such cysts is the kidney proper. The under surface shows numerous well vascularized trabeculæ. The cysts vary in size, but large ones may extend from the diaphragm to the pelvis. They are more common in females.

In the cases reported about one-half were operated upon with a preoperative diagnosis of ovarian cyst. The symptoms are those occasioned by pressure on contiguous structures. Palpation reveals a cystic tumour, which must be differentiated from pancreatic cyst, omental cyst, and retroperitoneal tumour.

Perirenal cysts are developed within the capsule of the kidney. In discussing their development the author reviews the anatomy, pointing out that the capsule of the normal kidney strips readily and has its own blood and lymph supply. Outside of the true capsule is the fatty capsule, the periphery of which is condensed to form the perirenal fascia. The fascial layer is defective at the lower pole, allowing a communication between the fatty capsule and the retroperitoneal fat. The blood supply around the kidney is very rich.

There are three systems of lymphatics: first to the kidney proper, the second to the fibrous capsule, and the third to the fatty capsule. A free anastomosis exists between the three systems.

Perinephritis is given as the cause of a certain number of perirenal cysts. There are four types of perinephritis: (1) Perinephritis serosa; (2) perinephritis hæmorrhagica, the result of trauma; (3) purulent perinephritis; (4) chronic perinephritis. There is also a close relationship between hydronephrosis and perirenal cyst formation.

In speaking of treatment the author is a strong advocate of approaching the kidney by the abdominal extra-peritoneal route. He uses the upper lateral rectus incision, commencing the stripping back of the peritoneum at the outer border of the rectus muscle. The kidney vessels, the kidney itself, and the ureter down to the bladder are brought into excellent view by this route. R. V. B. SHIER

Acute General Peritonitis and its Treatment. Handley, W., *Brit. Jour. of Surg.*, January, 1925.

This paper is a discussion of peritonitis of appendiceal origin. A definition of general peritonitis is given but the author asserts that rarely is the peritonitis of appendiceal origin general, but is practically always localized. The treatment advocated by Murphy, that is, drainage, continuous rectal administration of saline, and the Fowler position, has reduced the mortality 20 per cent, while the introduction of several ounces of flavine solution into the peritoneal cavity as advocated by Sir John Bland Sutton has been of decided value. However, when these measures fail to promote inprovement, the surgeon should not be "flaccid with resignation but taut with resolve." These patients die of intestinal obstruction due to paralysis of a segment of bowel, usually in coils of small bowel in the pelvis. The author makes two assertions:—(1) That the peritonitis is pelvic in origin; (2) that, if unrelieved, the patient dies from obstruction before the peritonitis becomes universal.

There are three stages to the peritonitis under consideration:

1.—Stage of pelvic peritonitis, as evidenced by pyrexia, quick pulse, pelvic pains, sometimes colicky, lower abdominal distension and tenderness, but no rigidity. On rectal examination acute tenderness.

2.—Stage of hypogastric peritonitis. In this the previous signs and symptoms are aggravated. Vomiting is vigorous and copious, but not frequent. There is distension, rigidity, tenderness, and immobility of the lower abdomen. Small quantities of flatus may be obtained per rectum by enemata or eserine or both. A large bowel movement may follow such treatment, resulting in recovery.

3.—Terminal stage. This he calls the "text book" stage, with all the classical signs of general peritonitis. The vomiting of this stage is

entirely different. It is effortless and frequent. The vomitus spills out of the patient's mouth. It is purely a mechanical vomiting due to pressure. In this stage the patient is hopeless.

The treatment advocated is as follows: If obstruction comes on during the pelvic stage the author favours an ileo-cæcostomy, leaving a catheter in the cæcum. If the obstruction begins in the stage of hypogastric peritonitis, or rather, if the condition of the patient is first recognized in this stage, he anastomoses the jejunum to the ascending colon or transverse colon, and ties a Paul's tube in the cæcum.

During the last nine years the author has had four cases in the stage of hypogastric peritonitis, all of whom, according to his previous experience, would have died. However, by using the treatment indicated three out of the four recovered. R. V. B. SHIER

On Cerebral Fat Embolism: Report of a Case with Recovery. Corlette, C. E., *The Med. Jour. of Australia*, March 7, 1925.

It is pointed out that fat embolism of the lungs following fractures is probably of frequent occurrence, but it is usually so mild as to be of no great practical importance. Fat embolism of the brain, however, is usually fatal, but it is a rare condition, and this accounts for its being so seldom diagnosed. In reviewing the literature, Dr. Corlette refers to a series collected by Le Count and Gauss in 1915. This included fourteen fatal cases, in all of whom one or more bones had been fractured. All these cases suffered from definite cerebral symptoms, some being wildly delirious. Several hours elapsed between the time of injury and the development of symptoms. There were large numbers of fat emboli in the lungs and kidneys in all the cases, and a varying frequency of their occurrence in the other organs. The development of petechial eruptions at varying intervals after the injury is taken to be almost a pathognomonic sign, though it is not always present.

In the case reported by Dr. Corlette, there was a fracture of the tibia and fibula. Nothing untoward was noted in the condition of the patient until thirty-five hours after admission. He then complained of feeling ill, the respirations increased and the temperature rose to 101° F. Later that day he became comatose, with preceding delirium. The lungs showed generalized rhonchi and crepitations. On the following morning there was spasticity of the right lower limb, with extensor reflex. A marked petechial rash now appeared on the thorax, with a few scattered spots on the limbs and abdomen. He recovered consciousness in a day's time, but was very drowsy and his memory was blunted. In a few days all symptoms had disappeared, and he was later discharged in an improved condition.

Mention is made of recovery from cerebral fat embolism in three other cases reported by R. H. Dahl (abstracted in *Brit. Med. Journ.*, September 27, 1924). H. E. MACDERMOT

Preoperative and Postoperative Care, and Methods of Anæsthesia in Gastric Surgery (Le cure pri—e postoperatorie e i metodi di antesia nella chirurgicia gastrica). *Gazzetta degli Ospedali e delle Cliniche*, March, 1925, p. 217.

The importance of thorough physical examination beforehand is emphasized. The estimation of the blood urea and the alkaline reserve are most important.

In preparing the patient for operation the most important measures are complete mental and physical rest and judicious feeding with farinaceous foods, vegetables, minced raw meat, etc. Plenty of liquids containing sugar should be administered by the mouth, by hypodermoclysis or proctoclysis.

Pulmonary complications account for 30 per cent of the deaths after operation. The anæsthetic plays an important part in causing them, by direct irritation, and by allowing the inhalation of vomitus. Limitation of movement from pain, reflexes through the vagus, nose, pharynx or stomach also play a part. Grégoire recommends washing out the stomach with weak iodine solution but this is not enough. Better is preventive vaccination with the enterococcus of Thiercelin. Cerf and Pauby give an injection of antipneumococcus serum.

The various advantages and disadvantages of chloroform, ether, nitrous oxide, ethyl chloride and spinal anæsthesia are discussed. The writer thinks local anæsthesia most satisfactory, but insists on the necessity of special gentleness in manipulation.

The sitting posture should be maintained after operation. The patient should be encouraged to drink as much liquid containing

sugar as possible. Where there is vomiting the stomach should be washed out with alkaline fluids. W. B. HOWELL

Observations upon Spinal Anæsthesia (Considérations sur la Rachianesthésie), Vaquié, G. E., *La Presse Médicale*, March 28, 1925.

The writer has performed 2,250 operations under spinal anæsthesia, without a death. He has seen very few unpleasant symptoms due to the method. He uses a solution composed of stovaine 0.75 grms., alypine 0.15 grms., sulphate of strychnine 0.001 grms., distilled water 10 cc. This is enough for ten ampoules.

All his operations were on parts below the level of the nipple. He occasionally made the injection between the first and second dorsal vertebræ, using half the usual dose. More often when he wished to obtain high anæsthesia he gave the injection between the third and 4th lumbar vertebræ and lowered the head of the table. He allows 4 to 5 cc. of cerebrospinal fluid to escape and dilutes the anæsthetic with an equal quantity of cerebrospinal fluid in the syringe. The higher the anæsthesia required the greater the dilution necessary.

After the operation the patient is put back into bed, great care being taken to avoid sudden movements. He is kept absolutely quiet, not being allowed a pillow or even to raise his head.

The writer has never had to stop an operation on account of any complication, while using stovaine-alypine. W. B. HOWELL

DERMATOLOGY

Lime Dermatitis. O'Donovan, W. J., *The Lancet*, March 21, 1925.

In the wide field of industrial life hazards to health are ever increasing. It has been estimated that sixteen per cent of all skin cases are due to the patient's work. In this report the ill effects of lime upon the skin are shown to be greater than dermatologists have realized. The patient's trade label is often a most insufficient guide to this special industrial risk. The accepted title of the calling may, in the analysis of cases, be quite misleading and little help is obtained from the patient, owing to congenital obtuseness.

Occupational dermatoses are often missed in diagnosis because many agents produce superficially similar dermatitis or one simulating a common skin affection not regarded as due to an external irritant. A case is cited where lime dermatitis was first diagnosed as seborrhoeic. A superimposed secondary infection, on a trade dermatitis, is very confusing.

The types of lime dermatitis are lime holes, vesicular eruptions or cheiropomphloyx, seborrhoeic eczema, exfoliative dermatitis, intertrigo erythrodermia and pustular follicular dermatitis. Oversweating or abnormal dryness of the skin are predisposing factors.

Preventive measures are frequent changes of dust-laden clothing, employment in lime-free work and nightly application of emollient grease to the skin of the face, forearms and hands. C. R. BOURNE

Amœbiasis Cutis. Heimburger, L. F., *Arch. Derm. and Syph.*, January, 1925.

Skin infection by amœbæ is very rare. A case is reported of a Chinese farmer, aged thirty-nine, with intense pain in the right abdomen and recurrent dysentery. There was an ulcer in the right lumbar region 2½ by 1¼ inches, and over an inch deep, with a smaller ulcer near by which coalesced later on. A warm stage examination of the pus revealed typical active amœboid organisms, as well as cocci. A sinus was found leading from a liver abscess to the floor of the ulcer.

Hypodermic injections of emetin hydrochloride, 0.13 gm., were given daily. The result is described as "marvellous." An uneventful recovery followed in eleven weeks. Pulv. ipecac. was applied to the ulcer for one week, but the author gives the emetin the credit for the cure. The case proves that amœbic skin infection does occur. Care of the skin is advised in operations on amœbic liver abscess. C. R. BOURNE

Miscellaneous

CONTRIBUTIONS TO THE LISTER MEMORIAL CLUB OF THE CANADIAN MEDICAL ASSOCIATION TO MAY 1ST., 1925

Alberta

College of Physicians and Surgeons	$450 00	
J. S. McEachern, Calgary	25 00	
		$475 00

British Columbia

T. B. Anthony, Vancouver	$10 00	
R. B. Boucher "	10 00	
F. J. Buller "	10 00	
B. H. Champion "	10 00	
G. H. Clement "	10 00	
Robert Crosby "	10 00	
J. A. Gillespie "	10 00	
G. S. Gordon "	50 00	
Colin Graham "	10 00	
T. H. Lennie "	10 00	
J. J. Mason "	10 00	
H. H. Milburn "	10 00	
A. S. Monro "	10 00	
J. H. MacDermot "	10 00	
N. E. MacDougall "	10 00	
R. E. McKechnie "	10 00	
W. C. McKechnie "	10 00	
P. A. McLennan "	10 00	
Lachlan Macmillan "	10 00	
J. McNichol "	10 00	
F. C. McTavish "	10 00	
P. H. Patterson, Victoria	10 00	
E. H. Saunders, Vancouver	10 00	
G. E. Seldon "	10 00	
D. A. Tompsett "	10 00	
J. W. Thomson "	10 00	
		$300 00

Manitoba

J. D. Adamson, Winnipeg	$10 00	
A. W. Allum "	10 00	
C. A. Barager, Brandon	10 00	
G. V. Bedford, Winnipeg	10 00	
P. C. Bell "	10 00	
R. J. Blanchard "	10 00	
Wm. Boyd "	10 00	
B. J. Brandson "	10 00	
A. M. Campbell "	10 00	
S. Campbell "	10 00	
Wm. Chestnut "	10 00	
Wm. Creighton "	10 00	
J. R. Davidson "	10 00	
S. J. Elkin "	10 00	
G. S. Fahrni "	10 00	
M. Finklestein "	10 00	
George Fletcher "	10 00	
H. Galloway "	10 00	
W. A. Gardner "	10 00	
A. Gibson "	10 00	
J. A. Gunn "	10 00	
J. Halpenny "	10 00	
T. G. Hamilton "	10 00	
Charles Hunter "	10 00	
J. E. Lehmann "	10 00	
W. L. Mann "	10 00	
Ross Mitchell "	10 00	
E. W. Montgomery "	10 00	
E. S. Moorhead "	10 00	
D. McIntyre "	10 00	
N. K. McIvor "	10 00	
Hugh MacKay "	10 00	
F. D. McKenty "	10 00	
James McKenty, Winnipeg	$10 00	
C. A. MacKenzie "	10 00	
N. J. Maclean "	10 00	
J. C. McMillan "	10 00	
S. W. Prowse "	10 00	
C. R. Rice "	10 00	
R. F. Rorke "	10 00	
J. Steffanson "	10 00	
Harvey Smith "	10 00	
G. Stephens "	10 00	
R. R. Swan "	10 00	
J. O. Todd "	10 00	
T. Turnbull "	10 00	
E. J. Washington "	10 00	
		$470 00

Ontario

H. W. Aikins, Toronto	$100 00	
E. St. George Baldwin "	250 00	
I. H. Cameron "	100 00	
M. V. Cameron "	10 00	
W. A. Cerswell "	10 00	
C. W. L. Clark "	10 00	
F. A. Cleland "	10 00	
Mrs. W. B. Coulthard "	100 00	
T. A. Davies "	10 00	
J. G. Gallie "	10 00	
W. E. Gallie "	10 00	
R. R. Graham "	10 00	
F. LeM. Grassett "	200 00	
W. B. Hendry "	10 00	
W. H. Harris "	10 00	
R. M. Janes "	10 00	
D. Jordan "	10 00	
A. B. LeMesurier "	10 00	
A. L. Lockwood "	10 00	
F. W. Marlow "	25 00	
A. A. Macdonald "	10 00	
J. L. McDonald "	10 00	
J. C. McClelland "	10 00	
Robin Pearce "	10 00	
A. H. Perfect "	10 00	
A. Primrose "	100 00	
F. Risdon "	10 00	
D. E. Robertson "	10 00	
J. W. Ross "	10 00	
W. Scott "	10 00	
R. V. B. Shier "	10 00	
H. B. Small, Ottawa	10 00	
C. L. Starr, Toronto	10 00	
F. N. G. Starr "	100 00	
C. S. Wright "	10 00	
H. Wookey "	10 00	
W. A. Young "	10 00	
Kingston and Frontenac Medical Society	50 00	
Sault Ste. Marie Medical Society	10 00	
N. Waterloo Medical Association	10 00	
S. Waterloo Medical Association	10 00	
Victoria County Medical Society	20 00	
York County Medical Society	10 00	
		$1,375 00

Quebec

F. O. Anderson, Montreal	$ 10 00	
Edward Archibald "	100 00	
George Armstrong "	100 00	
David Ballon "	10 00	
Walter Barlow "	10 00	
A. T. Bazin "	100 00	
H. S. Birkett "	25 00	

A. D. Blackader	Montreal	$20 00
W. G. M. Byers	"	10 00
W. W. Chipman	"	50 00
Wm. H. Delaney	Quebec	10 00
J. D. Dixon	Lachine	10 00
E. M. Eberts	Montreal	25 00
F. R. England	"	15 00
W. E. Enright	"	10 00
John Fraser	"	10 00
Wm. Gardner	"	60 00
A. H. Gordon	"	10 00
C. C. Gurd	"	10 00
D. F. Gurd	"	10 00
Alex. Hutchison	"	20 00
R. de L. Johnson	"	10 00
Richard Kerry	"	10 00
H. M. Little	"	10 00
F. A. Lockhart	"	10 00
C. F. Martin	"	50 00
David MacKenzie	"	10 00
D. Patrick	"	10 00
H. E. MacDermot	"	5 00
Lady Roddick	"	200 00
Miss Roddick	"	
Miss Margaret Roddick	"	
E. St. Jacques	"	10 00
Harry Shaw	"	10 00
F. J. Shepherd	"	25 00
Charles Vipond	Montreal	$10 00
C. F. Wylde	"	10 00
		$1015 00

Saskatchewan

A. L. Lynch	Saskatoon	$10 00
		$10 00
Total		$3,645 00

Total by Provinces

Alberta	$ 475 00
British Columbia	300 00
Manitoba	470 00
Ontario	1,375 00
Quebec	1015 00
Saskatchewan	10 00
	$3,645 00
Less Exchange	6 99
	$3,638 01
Interest	65 50
Amount on Deposit	$3,703 51

Relapses and Second Attacks of Measles.—G. Macciotta (*Il policlinico*, Sez. Prat., January 16th, 1925, p. 116) states that while almost all textbooks are agreed as to the possibility of relapses and second attacks of measles, such an occurrence is regarded as exceptional. Macciotta, however, records eight cases of relapse and three of second attacks, all of which were observed in the same epidemic during the spring of 1924, and occurred in about 1 per cent. of all cases of measles. Relapses appeared in children aged one to seven years within a few weeks of the primary attack, -while the second attacks were in persons aged from fifteen to twenty-seven who had suffered from measles in infancy. Macciotta attributes the occurrence of relapses and second attacks to an exaltation of the virulence of the causal organism of measles on the one hand, and a diminution of organic resistance on the other. The two predominant factors in his cases were the familial and the tuberculous. Four of the patients were two pairs of brothers, and two were cousins. Five of the relapse cases were tuberculous, and tuberculosis could not be excluded in the remainder. Of the three patients with second attacks, one subsequently died of pre-existing tuberculosis and another showed signs of phthisis.—***Brit. Med. Jour.***, April 4, 1925.

A STUDY based on the United States Census of 1900 showed that only 7.4 per cent. of the women under forty-five years of age, who had been married fom ten to twenty years, living in the State of Rhode Island, the cities of Cleveland and Minneapolis and the rural sections of Ohio and Minnesota, had no children. Among women of native parentage the percentage was more than twice that of foreign parentage. The fact that a very valuable element in our population is failing to reproduce itself has been demonstrated again and again. Possibly something is to be gained by frequent reiteration of the seriousness of the situation. A more general appreciation of its gravity might result in a greater ratio of thoughtful and intelligent men and women reproducing to a larger degree than the above data indicate.—*Bulletin Metropolitan Insurance Co.*, March, 1925.

"THOUGH the numbers of thine ears shall equal Argus his eyes; yet stop them all with a wise man's wax, and be deaf unto the suggestion of talebearers."—Sir Thomas Browne.

"LET reason be before every enterprise, and counsel before every action."—*Ecclesiasticus.*

Medical Societies

THE PREVENTION AND TREATMENT OF POST-OPERATIVE PULMONARY AFFECTIONS

This subject was discussed at a combined meeting of the Sections of Surgery, Anæsthetics, Medicine, Obstetrics and Gynæcology, and Pathology of the Royal Society of Medicine, on February 4th.

The discussion was opened by Mr. E. C. Lindsay, who said that it was coming to be felt that post-operative lung complications, such as pneumonia, pleurisy, and collapse of the lung, were the result of pulmonary embolism and infarction, rather than arising from irritation or congestion. He quoted observers who considered that 40 per cent of pleurisies and 12 per cent of pneumonias after gynæcological operations were due to pulmonary embolism: this might be either of the massive type, in which one or both pulmonary arteries were occluded, or the infarction type, followed by pleurisy and signs of consolidation. There was also the type, caused by an embolus, lodging in such a site as to make its recognition difficult; such cases showed a slight increase in respiratory rate, with mild evening pyrexia, and small amounts of bloody expectoration. In many cases a premonitory sign of the massive embolism was an urgent desire to defæcate, possibly due to a vasomotor reflex set up by the passage of the clot from the femoral or iliac veins.

The records of surgical cases at the London Hospital for the years 1914-24, showed 114 cases of pulmonary embolism. Some thought that the condition was on the increase, but the series quoted agreed very closely with a series of 22,000 operations from 1903 to 1920, collected by Rupp. This observer noted also that the mortality of pulmonary embolism in internal disease without operation was 1.1 per cent,—four times as high as that following operation. Age was a very important factor, the average in the London series being fifty-two years. As had been found in other series, gynæcological operations headed the list in order of frequency of embolism, followed next by gastric and then by appendix cases. In St. Thomas's Hospital, however, the gynæcological department did not show any greater frequency that the surgical, and the figures of the Mayo Clinic showed about 0.12 per cent (fatal cases) whilst other abdominal operations showed about 0.18 per cent.

In the gynæcological cases post mortem examination showed thrombosis of the pelvic, iliac and femoral veins in a smaller proportion than was found in the gastric cases, a noteworthy fact because in the one case the systemic venous system was involved by the operation, and in the other the portal system. The post mortem notes showed no mention of extensive thrombosis at the site of operation. Primary pulmonary thrombosis he found difficult to understand, in view of the size of the thrombus, its frequently unbranched appearance, and the fact of its being nearly always rolled up.

Dr. Shipway commented on the fact that these pulmonary complications occurred more often after abdominal, and especially upper abdominal, operations, than elsewhere. He thought that the greatest care should be taken to prevent the patient from being exposed to changes in temperature after anæsthesia; in large wards perhaps this was more liable to occur than in private rooms. The mechanism underlying massive pulmonary collapse was not yet thoroughly understood, although recent observations pointed to a nervous origin. Local anæsthesia was not yet completely proved to be less dangerous as regards these complications, than general anæsthesia.

Mr. J. P. Hedley thought that the great difficulty in prevention of post-operative pulmonary complications was that their cause was not definitely known. Some thought that nearly all cases resulted from embolism, and others that they were due to disturbances of anæsthesia which stirred up latent pulmonary conditions. On the latter assumption reasonable precautions could be taken to protect the patient both in the theatre and in returning to the ward, and while in the ward as well. As regards later pulmonary complications, there was evidence

that particles of tissue might become detached and carried to the lungs and this might obviously be guarded against to a certain extent by avoiding damage and bruising of tissues in the neighbourhood of the operation. Hæmorrhage predisposed to thrombosis, and starvation and pre-operative purgation might both add to the risk.

Sir Charles Gordon-Watson also referred to the comparative frequency of these complications in abdominal operations. It had been found that 10.8 per cent of 222 consecutive severe abdominal operations developed pneumonia, whereas in only 0.7 per cent of 1,100 orthopædic operations had it occurred. It had been pointed out that this might be due to the inter-relation between the muscles of the abdominal wall and the diaphragm.

Dr. R. Hutchison considered that thrombosis was often postural and due to the adoption of the Fowler position, which also tended to expose the patient's chest. H. E. MacDermot

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The Problem of the Subnormal—What is to be done with them and why? The subnormal or mentally deficient is to-day, one of our biggest problems. It is not a new one, but it is one which has been neglected. Many of these children die during their younger years, not having the sense to look after themselves properly, but many grow to mature years. Are we to guard against them marrying and bringing into the world more of the same subnormal kind? They are usually prolific. Shall they be allowed to go among us, unguarded, uncared for, to commit their crimes and be a burden on the taxpayer and a menace in many cases to the safety of the community? Education is the first step in prevention. Segregate them into special classes and give them a chance. It is hoped that the school trustees in our larger centres will soon accept the responsibility which is theirs, and have in the areas, in which any necessity exists such classes established. These poor creatures cannot be given new brains, but they can, under special teachers, and in special classes, be taught sufficient to enable many of them as tradesmen or domestics to go through life as useful, law-abiding, self-supporting members of our communities; free from the commission of the crimes many of which if left alone, they may become responsible for.

If they are left in the ordinary school class, their time is wasted, as they cannot keep up with the normals, but they definitely slow the work of the class as a whole and lower the class discipline and morale. In other words, the teachers are unable to show proper results because of the presence of these children in the classes and so a portion of the money spent on our schools, is wasted. From the dollars and cents standpoint, then, let us segregate them, and increase the efficiency of the normals; and at the same time give these unfortunates the chance to which they are entitled. The government makes a special grant for their teachers. Experience proves that such methods have given good results; so why hesitate? Many of such have been educated to become self-supporting, honest, useful citizens, busy at their own work, and if busy, then they have not time for the crimes which they would otherwise be busy at. Such self-supporting product lessens our outlay for the support of alms-houses, prisons, asylums, the illegitimate children, and improves our general morale and efficiency as a people.—W. S. L., in *New Brunswick Monthly Health Bulletin*, April ,1925.

Effect of Pertussis on the Heart.—Analysis of 232 cases of pertussis as to its effect on the heart has convinced Paul V. Ledbetter, Houston, Texas, and Paul D. White, Boston, that there is no proof of endocardial or myocardial damage during or after pertussis. Circulatory failure does not seem to occur during pertussis, though the paroxysms of whooping cough undoubtedly do produce a temporary mechanical strain, particularly on the right side of the heart. No evidence of damage to the heart in any case, as a result of whooping cough, could be found in these 232 cases, although one child had chronic endocarditis and one had congenital heart disease before infection.—*Jour. A.M.A.*, April 4, 1925.

Obituaries

Dr. Reginald Henry Brett, only surviving son of Lieutenant-Governor R. G. Brett, M.D., died suddenly from heart failure on May 8th, in Edmonton, where he was attending a meeting of the Council of the College of Physicians and Surgeons, of which he was a member. He was born in Arkona, Ontario, May 5th, 1879. He was educated at St. John's College School, Winnipeg, and at St. John's College, later at Manitoba University, where he graduated in medicine in 1903. In 1906 he went abroad and spent two years in post-graduate studies in London and Vienna.

The name of Brett has been closely identified with Banff, Alberta, since 1884, when Dr. R. G. Brett, his father, settled there and later opened a hospital, known as the "Brett Sanitarium," familiar to thousands of visitors at this famous resort. For many years Dr. Harry Brett was in partnership with his father, until the latter went to Edmonton to take up official duties.

He was Coroner for the District of Banff, and Medical Officer for the Rocky Mountain Park, as well as being surgeon to the Canadian Pacific Railway. For many years he represented Banff district on the Council of the College of Physicians and Surgeons and was president of this body in 1919-1920.

Endowed with an attractive personality he won friends easily and long retained their friendship. He was well known as a sportsman especially as a hunter and golfer. He is survived by his wife, to whom, as well as to his parents, the sympathy of the medical profession of Alberta is extended.

Dr. Harold G. Nyblett, of Calgary, died April 28th, after an illness of several months, which was borne with fortitude and stoicism. Born in London, England in 1871, he was the son of Dr. Alfred Newson Nyblett. Coming to Canada in 1888, he entered Trinity College in 1892, graduating in 1896 in medicine. Shortly after graduation he went to Manitoba to practise, later to Saskatchewan and subsequently to Macleod, Alberta, where he remained until the outbreak of the war. He came to Calgary August 13th, 1914, to take command of the 17th Field Ambulance. He saw service in England and in France. He remained in the army until 1919, retiring with the rank of Major. From 1919 until 1924 he practised in Calgary. His strong characteristic was that of a clean sportsman. He had a fine sense of justice. The sympathy of his confrères in Calgary is extended to his wife and three children, who mourn his loss.

Dr. Peter Aylen, one of the oldest practitioners of Medicine in Alberta died at Fort Saskatchewan during the latter part of April. He was a graduate of McGill University of the class of 1886. Two years later he came west with the North West Mounted Police, with which organization he remained for many years, rendering signal service in many of the sparsely settled districts of this wide domain, finally settling in Fort Saskatchewan, Alberta.

Dr. Paul Gauthier chief interne of St. Paul's Hospital, died of malignant diphtheria contracted in the performance of his professional duties. Dr. Gauthier, who was in his twenty-seventh year, was taken ill suddenly and died at the hospital of which he was the superintending physician. Dr. Gauthier was born in Montreal, son of the late Henri Gauthier, contractor. After graduating last year from the University of Montreal he became attached to the interne staff of St. Paul's Hospital but after several months he was transferred to the Notre Dame Hospital. He returned to the St. Paul's Hospital last January as chief interne. He was well known in medical circles and a brilliant future had been predicted for him by his confrères.

Dr. Joseph Trembley of St. Anne de Beaupré, died recently after only five days illness. Dr. Trembley was educated at Baie St. Paul and finished his course in medicine in 1893. After graduation he settled in St. Anne de Beaupré where he remained until his death.

Basal Metabolism in Organic Heart Disease with Decompensation.—An investigation was made by Walter W. Hamburger and Morris W. Lev, Chicago, to determine what if any, was the relation of the basal metabolic rate to the various stages and types of cardiac decompensation. As far as possible, patients with uncomplicated heart failure were chosen, to avoid those in whom the basal metabolism might be influenced one way or another by other factors. The striking finding so far has been the general elevation of the basal metabolic rate in cardiac decompensation, the elevation increasing as the clinical picture of decompensation became worse, and decreasing, and even going below normal, as the heart become compensated. Seventeen patients were observed. Of the total number, thirteen patients, or more than 76 per cent., showed a primary or subsequent elevation of the basal metabolic rate at the first determination, but compensation had already become established at the time the reading was made. The lowest initial increase of the basal metabolic rate in the series was 11.8 per cent. above normal, while the highest reached 112.7 per cent. above normal. The average initial basal metabolic rate increase in the thirteen cases was 39.1 per cent, above normal. The prognosis is better in those decompensated heart cases in which the primary or the subsequent basal metabolic determinations are decreased. The vital capacity is decreased in heart muscle failure, and increases sa compensation becomes established. The exact causes of the increased basal metabolic rate in organic heart disease with decompensation have not yet been determined.—*Jour. Am. Med. Ass.*, February 21, 1925.

XUM

Medical News from the British Empire

GREAT BRITAIN

The King has, on the recommendation of the Secretary for Scotland, appointed Mr. John Fraser, M.D., Ch.M., F.R.S. Ed., to be Regius Professor of Clinical Surgery in the University of Edinburgh, in the room of Sir Harold J. Stiles, whose resignation took effect on March 21st. Dr. Fraser, who graduated M.B. with honours in 1907, is a native of Tain. He became a Fellow of the Royal College of Surgeons of Edinburgh in 1910, and took the degree of M.D. in 1912, being awarded a gold medal for his thesis, and the degree of Ch.M. with honours in 1910. He has been assistant surgeon to the Edinburgh Royal Hospital for Sick Children since 1920. During the war he served with distinction in the Royal Army Medical Corps and gained the Military Cross. He is author of *Tuberculosis of the Bones and Joints in Children*, and of numerous papers on surgical shock, tumours of the kidney, abdominal emergencies in children, and pneumococcal peritonitis. He has gained a high reputation in the medical profession as a skilled and successful operator, as well as for valuable research on surgical subjects.

The Royal College of Physicians has passed a by-law making women eligible for fellowship. This is another step in the struggle of women to obtain the same right as men in the medical profession, a struggle which began only within this generation.

Three cases of rabies occurred in dogs in Great Britain during the last three years. All were imported dogs still in quarantine. The restrictions will not be relaxed.

News Items

NOVA SCOTIA

The annual meeting of the Aberdeen Hospital Trust was held at New Glasgow on the 15th of April. The reports presented were all of a very satisfactory nature. Patients treated during the year numbered 976, the hospital days totalling 19,918. The per capita cost per day was $2.57. Receipts exceeded expenditures by upwards of $4,000.00. Bequests amounting to over $21,000.00 permitted of considerable reduction of the debt on the Nurses' Residence. A bronze tablet is to be placed in the hospital in honour of Rev. Dr. Carruthers, who was the prime mover in the establishment of the institution. The Aberdeen Hospital has the distinction of being the pioneer local hospital in the province, and it has always maintained a leading position among these institutions.

The final examinations in Medicine at Dalhousie University resulted successfully for forty-three of the forty-seven candidates. The University medal in Medicine was awarded to Sebastien Paul Young, of Curling, Newfoundland. The Dr. Clara Olding Prize (fourth year) was awarded to Harold Robertson, B.A., of Halifax; the Dr. Lindsay Prize (third year) to J. W. Merritt, of Springhill; and Professor Cameron's prize (second year) to J. L. Nickerson, of Halifax.

Col. H. M. Jacques, D.S.O., who was Senior Medical Officer of Military District No. 6 for several years, has been appointed Director General of Medical Services, and has removed to Ottawa. His departure from Halifax is much regretted by his many friends, who, however, rejoice in his promotion. Before leaving Halifax, he was the guest of honour at a number of farewell functions. His successor at Halifax is Col. J. T. Clarke.

The Halifax Branch of the Medical Society of Nova Scotia held its last meeting for the session at the Ashburn Golf and Country Club on the 22nd of April. Custom requires this meeting to take the form of a dinner, and this year's function proved to be particularly enjoyable. The reports on the winter's work were all very encouraging, and the general verdict was that the session had been the most successful in the history of the branch. Officers elected for the ensuing session are: President, Dr. F. R. Little; Vice-Presidents, Doctors P. Weatherbe, V. L. Miller and S. R. Johnston; Secretary, Dr. W. L. Muir. The retiring president, Dr. E. V. Hogan, expressed his appreciation of the support given to him by the Executive and members, and bespoke similar support for his successor. A short musical programme added to the pleasure of the evening, and it is rumoured that some members lingered after adjournment to witness a demonstration of a coin-extractor technically known as poker.

The Osler Medical History Club concluded the session on the 25th of April, when the host of the evening, Dr. Hattie, read a paper on Paracelsus.

The Nova Scotia Branch of the Canadian Red Cross Society is administering a fund of $20,000.00 placed at its disposal by the Government of Nova Scotia for the benefit of the families of striking coal miners.

Work has been commenced on a new building for the St. Martha's Hospital, Antigonish, to accommodate approximately one hundred patients. The contract price for the building is in excess of $250,000.00.

The Annual Meeting of the Provincial Medical Board of Nova Scotia was held on the ninth of May. Very satisfactory reports on the work of the year were received. Doctors J. G. McDougall and W. H. Hattie, of Halifax, were re-elected President and Secretary respectively.

QUEBEC

The Hospital Francais, St. Denis Street, has purchased the Montreal Maternity Hospital premises, which are being vacated by the Maternity Hospital following its merger with the Royal Victoria Hospital last year. The Hospital Francais will move into the Maternity Hospital premises in May, 1926, after extensive alterations and large extensions to the existing structure and will operate it as a French General Hospital. Projected extension are as follows:—two storeys will be added on the side fronting St. Urbain Street; a new wing will be added on the lane fronting Prince Arthur Street and a further new wing on the lane between St. Famille and St. Urbain Street. There is a shortage of 1,300 beds in the French hospitals, Dr. de Martigny estimated. The extra accommodation afforded by the removal to the Montreal Maternity Hospital premises next year will do much to relieve that shortage. The work of the Montreal Maternity Hospital, according to the terms of the merger announced last year, will be carried on in the Royal Victoria-Montreal Maternity Pavilion on a greatly extended scale.

In the course of a few days the governors of the Homeopathic Hospital, McGill College Avenue, will announce the opening and closing dates of a drive to raise funds for the construction of a larger hospital on a property on Marlowe Avenue in Notre Dame de Grace, immediately south of Sherbrooke Street. The present hospital was established on McGill College Avenue in 1894, and was enlarged and incorporated in 1904, but, during the last few years, like other institutions of its kind, the demand made upon it for beds had far exceeded its capacity. In 1924, land for a new building was purchased on Marlowe Avenue. The Homeopathic Hospital of Montreal has always been an open-door hospital where any recognized physician is privileged to care for his own patients in the private wards, and this policy will be continued in the new building upon its completion.

Dr. C. F. Martin, Dean of the Faculty of Medicine, McGill University, will deliver an address at the opening of the Roddick Memorial Gates, erected by Lady Roddick at the Sherbrooke Street entrance to McGill University, in memory of her husband, the late Sir Thomas Roddick, one time Dean of the Medical Faculty of McGill. The ceremony will take place at 2.30 p.m. on May 28th. Lady Roddick; the Chancellor, E. W. Beatty, and the Principal, Sir Arthur Currie will lead the academic procession from the Royal Victoria College to the new gates, followed by the graduating classes and the university staff, in academic dress. Lady Roddick will unlock the padlock and the key will then be presented to her in an engraved box. The procession will then proceed through the gates to the front of the Arts Building where a dedicatory service will be held.

An increase of bed accommodation in hospitals rather than an increase in the number of hospitals in the city is what is needed in Montreal, according to Dr. L. de L. Harwood, speaking from the chair at the forty-fourth annual meeting of the Notre Dame Hospital. The hospital situation he pointed out, was not in the best shape, but lack of beds he thought properly described the situation and not lack of hospitals. The year of 1924 was an unusually busy one. Although the hospital had moved into its new enlarged quarters on Sherbrooke Street, accommodation was still lacking. The heavy demand for the care of the sick increased and yet patients have to be turned away. Another wing will be constructed but up to the present this has not been contracted for. The new wing will be known as the Champlain wing.

Grave counsels for the future were mingled with humorous reminiscences and adieus at the valedictory banquet of the graduating medical class of Montreal University held in the Rose Room of the Windsor Hotel. The room was fiilled with the graduates and delegates from Laval and McGill Universities, who together with members of the medical faculty, medical college and university directors joined in speeding the final year students on their way in the medical profession. The professional "red and black" of the faculty blended with the purple and gold of the university colours and lest the guests forget that it was a truly medical affair physiological, surgical and anatomical axioms were freely echoed through the room by groups of students elated that their academic studying was over.

A Shriners' parade, with its colourful entourage of divans, patrols, bands and chanters from all parts of the United States and Canada took place on May 16th, when the dedication of the Montreal Unit of the Shriners' Hospital for Crippled Children, Cedar Avenue, took place. The new Shriners' Hospital for Crippled Children was built by the Nobles of the Mystic Shrine of North America at a cost of $250,000 and will be maintained by them at a cost of $50,000 a year. The local hospital will take care of fifty children and is equipped with every facility known to that branch of science. It has been in full operation for several weeks.

Rotarians were welcomed to the Montreal General Hospital, where they met at lunch recently. Col. Herbert Molson, on behalf of the hospital authorities extended to the visitors a warm welcome. They were then escorted through the building by doctors, and nurses who explained the working of the institution. The luncheon was well attended. At the head table were seated a number of the hospital directors, including Col. Molson, president, and Messrs. A. E. Ogilvie, C. F. Neil, A. D. MacTier, J. T. Cahill and Dr. A. K. Haywood. Mr. Pemberton Smith presided. The Lady Superintendent, Miss Young, was also present. In extending a welcome to the visitors, Col. Molson stated that Montreal in his opinion was not sufficiently equipped with hospitals. He urged Rotarians to impress upon the authorities the necessity of greater assistance to hospital work. "We are lagging behind other communities in the United States and Canada. We have fewer beds than Toronto. We need more support, for the burden on the Governors is too great. We have for some years been trying to impress this fact on both our provincial and municipal governments; further aid must be forthcoming if we are to continue the work that the city expects us to do."

MANITOBA

On May 5th, the graduation exercises of the Winnipeg General Hospital Training School were held. Ninety-five nurses, the largest class in the history of the school, received their diplomas from the hands of the Superintendent, Miss Mary Martin, R.N. Mr. J. S. Hough, President of the Board of Trustees of the hospital presided; the address to the graduating class was given by Professor Kerr of Manitoba College.

MANITOBA SANATORIUM
FOURTEENTH ANNUAL REPORT

The annual report of the Manitoba Sanatorium at Ninette has just been received and is full of interest. It is a record of increasing achievement and those fortunate enough to receive it should read the report of the Medical Superintendent with care.

Patients in residence during the year increased from 260 to 280. Patients admitted for treatment numbered 308. In addition to these, 429 came for diagnosis, making 737 in all. Adding 266 patients carried through from the previous year it will be seen that a total of 993 were dealt with during the year.

The Sanatorium ministers not only to patients with early pulmonary tuberculosis, but also to those far advanced, and even apparently hopeless cases. In addition cases of non-pulmonary tuberculosis and a few cases of non-tuberculous respiratory disease are received. The cost per patient per day decreased seven cents and now stands at $2.61.

Teaching is being given to medical students, and to nurses, graduate and under-graduate. To patients and the public in general the important facts in regard to the prevention and treatment of tuberculosis are emphasized. In this way the sanatorium is becoming favourably known and its advantages recognized.

By the courtesy of the Winnipeg Dental Society the Medical profession of Winnipeg had the pleasure of listening to a lecture on May 12th, by Weston A. Price, M.S., D.D.S., F.A.C.D., Chairman and Organizer of Research Department of the American Dental Association. His subject was "Researches on the Relations of Dental Infections to Degenerative Disease with special consideration of Calcium Metabolism in Health and Disease." The lecture was much appreciated.

In an endeavour to elucidate the ætiology of pernicious anæmia, the Medical Research Committee of the Faculty of Medicine, University of Manitoba, has sent out a questionnaire on this subject to members of the medical profession in the western provinces.

The Manitoba Medical Alumni Association held a successful dinner in the Marlborough Hotel on May 29th during the postgraduate course.

SASKATCHEWAN

Dr. O. M. Irwin, of Swift Current, who was last year Vice-President of the District Association, is now in Edinburgh spending a year at post-graduate work.

Dr. D. W. Allen, of Weyburn, is taking post-graduate work in surgery at various hospitals in Europe. He anticipates being away for a period of two years.

The Weyburn District Medical Society, which was organized on October 19th, 1923, and which has been holding monthly meetings alternately at Weyburn, Yellow Grass and Estevan, held their last meeting on April 8th at Weyburn. The President, Dr. H. E. Eaglesham, entertained the members at a banquet at the Royal Hotel, after which Dr. R. M. Mitchell, Superintendent of the Weyburn Mental Hospital, gave a very interesting address on his experiences with typhoid. Dr. James E. McGillivray addressed the meeting on uterine displacements. The next meeting of the Society will be held at Estevan during the latter part of May.

The Swift Current District Medical Association, organized in November, 1923, by Dr. Routley, has progressed well, holding regular meetings at different points in the district. Dr. Low, President of the Canadian Medical Association was a visitor at one of the meetings during the past year, and among the papers given was one by Dr. Henry, of Regina, on x-ray therapy. The officers for the current year are: Dr. A. R. Gordon, of Morse, President; and Dr. J. H. Sharpe, of Swift Current, Secretary.

An investigation into the operation of the Abrams Machine by Dr. E. M. Carefoot, of Regina, was commenced on April 14th by the Discipline Committee of the College of Physicians of Saskatchewan. The probe continued for eight days and two nights. Dr. Carefoot was on the stand for two full days. For one whole day he was examined by F. L. Bastedo, and the following day he was under cross-examination by P. M. Anderson, K.C. The committee stated that both sides to the investigation were represented by counsel and every opportunity was given for a full and impartial hearing. Decision was reserved.

A meeting was held by the Regina and District Medical Society in the Parliament Buildings, Regina, on Wednesday, April 29th. The main object of the meeting, apart from routine business, was to hear the reports of various committees; and chiefly the committee appointed at our November meeting, on motion by Dr. Low, seconded by Dr. Black, "to investigate all factors operating in the name of public health, community welfare or in any manner which tends, directly or indirectly, to exploit the medical profession; and at the same time to bring in some remedy to effectually cope with it, satisfactory to all parties concerned." This committee was also asked to co-operate with the different district medical societies in the province in this matter in the hope that some way might be found whereby the various functions assumed by these different bodies at present operating, may be carried on amicably. This committee has reported progress, and are still engaged in this work and expect to have a full report to present at our next regular monthly meeting.

Dr. Dakin gave a paper on diseases of the ureters, illustrated by x-ray plates. They were all interesting and instructive, demonstrating in some cases the presence of stones in portions of the ureter; in others kinks of one of the ureters which had produced similar symptoms but were relieved by catheterization.

ALBERTA

Dr. Boe, of Medicine Hat, is now in California.

Dr. J. E. Mason, of Hanna, left recently for Chicago to take up post-graduate work.

Dr. R. R. Stoner, of Hay Lake, has moved to Irma, and has taken over the practice of Dr. S. McGregor, who has gone east.

Dr. R. B. Jenkins, of Alix, has recently been appointed Provincial Medical Health Officer, with headquarters at Edmonton.

Dr. W. W. Cross, of Youngstown, has returned from Chicago, where he spent some months in the study of physiotherapy.

A Private Hospitals Bill has recently been passed by the Alberta Legislature enacting that all private hospitals must be licensed. In this decree are included nursing homes, maternity homes and baby shelters.

No operations will be permitted excepting those of a minor character attendant on obstetrical cases. The sanction of the Provincial Department of Health must be obtained for other operations, such as curettage or Caesarian section, or those of a major type. Penalties are included in this new ordinance.

Dr. M. E. Tiffin, of Rockyford, is now in the east, engaged in post-graduate studies. While he is absent from Rockyford, Dr. Denuvan, of Drumheller, will look after his practice.

It is with deep regret that we chronicle the deaths of three well known practitioners of this province, viz: Dr. H. G. Nyblett, of Calgary; Dr. Harry Brett, of Banff, and Dr. Peter Aylen, of Fort Saskatchewan. Dr. Nyblett had been ill for several months and the final outcome was not unexpected. Dr. Harry Brett, son of Lieutenant-Governor R. G. Brett, died suddenly at Edmonton, where he was attending a meeting of the Council of the College of Physicians and Surgeons. Dr. Aylen passed away after an illness of some duration.. He was one of the oldest practitioners in the province.

BRITISH COLUMBIA

Dr. D. J. McDonald who has been spending the winter months in Vancouver, has returned to his practice at Kincolith, Naas River, B.C.

Dr. G. B. Henderson, Creston, is leaving on May 7th, for a well earned six weeks' holiday. His practice will be cared for by Dr. J. M. Burnett.

Dr. J. C. Farish and Dr. J. A. Smith have left for a short holiday trip on the *S. S. Empress of France*. This boat was recently in Vancouver on her trip round the world.

The deepest sympathy of the members of the British Columbia Medical Association is extended to Dr. A. J. Stuart, of Mission, in the loss he has sustained in the death of his wife, who passed away on May 2nd.

Dr. John A. Stewart, of Victoria, B.C. will visit Atlantic City and attend the Eye, Ear, Nose and Throat Clinics in the eastern centres. He leaves on the 20th of May and will be absent four months.

Over twenty Vancouver medical men made the trip to Seattle on May 1st, to take part in the Tri-City Golf Tournament. Subsequent games will be played in Vancouver and Victoria.

The graduating exercises of the 1925 class of the Vancouver General Hospital Training School for Nurses will be held this year on May 29th. The number of Nurses graduating will be eighty-eight, the largest class that has ever graduated from this hospital.

The monthly meeting of the Fraser Valley Medical Society was held on Thursday, April 30th. Clinical cases were given by Dr. G. W. Sinclair, Dr. H. L. Collins, Dr. W. A. Robertson, and Dr. G. S. Purvis. There was a good attendance of the local men.

The Annual Meeting of the British Columbia Medical Association will be held on Friday, July 3rd, concurrent with the Vancouver Summer School. It is proposed to hold a dinner on that occasion at which there will be a selected speaker from the visiting doctors.

The Victoria Medical Society held a special luncheon in honour of Dr. Gordon Fahrni, of Winnipeg. Although Dr. Fahrni was in Victoria on a visit to his mother, who resides in that city, he courteously agreed to address the Society on the subject of "Goitre." The address was much appreciated.

Dr. D. W. Davis, late of Coleman, Alberta, is now associated with Dr. D. P. Hanington, of Kimberley, B.C. The people of Kimberley are to be congratulated on their new and very up-to-date hospital, opened recently, which will enable the doctors in that district to carry on their work with greater advantage.

The Pacific Coast Oto-Ophthalmological Society is holding its annual meeting in Vancouver, June 18th, 19th and 20th, under the presidency of Dr. H. M. Cunningham, of Vancouver. Amongst the speakers at this conference will be Dr. Gordon New, of the Mayo Clinic; Dr. Edward Jackson, of Denver, Editor of the *American Journal of Ophthalmology*, and Dr. George Piness, of Los Angeles.

The Victoria, B.C. profession is going to have a strong representation at the annual meeting of the Canadian Medical Association in Regina. At least twelve men and a possible fifteen will make the trip to Regina with instruction from the Victoria Medical Society to press the request and urge the claim of Victoria for the annual meeting in 1926. They feel that the Canadian Association should cross the Rockies every six or seven years.

The list of lecturers at the Vancouver Medical Association Summer School Clinics has been augmented by the addition of Dr. J. G. Carr, Associate Professor of Medicine, Northwestern University Medical School, Chicago, who will be the lecturer in medicine.

Other lecturers are Dr. Hugh Cabot, of Ann Arbour; Dr. Alan Brown, of Toronto, and Sir Henry Gray, of Montreal. The meetings are on July 2nd, 3rd and 4th.

Mr. C. J. Fletcher, Executive Secretary of the British Columbia Medical Association, recently returned from his annual tour of the Okanagan and Kootenay districts, where he had made a personal visit to almost every practising member of the profession. He reported that he had been received by all very cordially, and that a keen interest was taken in all the activities of the Association. The membership fees were all paid up for the current year. This is very gratifying.

Vancouver Medical Society. — The twenty-eighth annual meeting of the Vancouver Medical Association was held in Vancouver on the 21st of April; when the following officers were elected:—President, Dr. J. A. Gillespie; Vice-President, Dr. A. W. Hunter; Secretary, Dr. G. H. Clement, and Treasurer, Dr. A. B. Schinbein. Dr. H. H. Milburn, the retiring president, discussed the activities of the Association during his term in office, referring especially to the publication of the monthly bulletin of the Association which had successfully reached its eighth number.

Sir Alfred Yarrow, Bart., who is in Victoria on

one of his frequent visits to his son, Mr. Norman Yarrow of Yarrow's Limited, was the guest of honour at a luncheon given at the Union Club by the Victoria Medical Society on May 2nd. Sir Alfred is well known to the profession in Great Britain through his good work in connection with the London Hospital, Yarrow Convalescent Hospital at Broadstairs in Kent, and his contributions of large amounts of money to aid research in the Old Country. His fame in engineering and shipping circles is world wide.

A meeting of the executive committee of the British Columbia Medical Association was held on April 29th, when the following matters were dealt with:—Dr. G. L. Milne, of Victoria, will be recommended at the annual meeting as an honorary member of the Association. The question of vaccination was brought up and it was decided that the Association should endeavour to obtain as much vaccine material from the Chairman of the Provincial Board of Health as possible, for distribution to doctors' offices. It was also suggested that the publication *Hygeia* be brought to the attention of medical men, who should be asked to keep copies in their offices for the benefit of their patients. Dr. Wallace Wilson, Chairman of the Publicity and Educational Committee, gave an interim report of the work of his committee.

A luncheon meeting of the British Columbia Medical Association was held at the Ambassador Cafe, Vancouver, on April 29th, when an instructive address was given by the Honourable Mr. Justice Denis Murphy, on "The Doctor in Court—Medical Evidence." The subject, in itself, was responsible for the large and representative gathering and the speaker's comprehensive handling of it delighted his audience. Doctors who are called upon from time to time to give evidence in law courts received some very useful advice, and our out of town members may look forward to its publication in the next issue of the Vancouver Medical Association Bulletin. Dr. H. H. Murphy, President-Elect of the British Columbia Medical Association in moving a vote of thanks to Mr. Justice Murphy, surprised those who had not previously heard him with the aptness of his impromptu remarks. The meeting was presided over by Dr. C. H. Vrooman, President; the following out of town doctors were present:—Drs. E. J. Rothwell, G. E. Drew, D. A. Clarke, and G. W. Sinclair, of New Westminster; Dr. J. Bain Thom, of Trail; Dr. J. E. Affleck, Penticton; Dr. G. K. MacNaughton, Cumberland; Drs. M. G. Archibald and H. H. Murphy, of Kamloops.

UNITED STATES

AN AMERICAN HEALTH CONGRESS

In order to give health workers from every part of the country a bird's-eye view of the public health movement in its broadest aspects, the National Health Council at 370 Seventh Avenue, New York City, has planned for an American Health Congress to be held at Atlantic City during the week of May 17th, 1926. The leading authorities on each phase of the public health movement; such as tuberculosis, cancer, heart disease, blindness, social and mental hygiene, public health nursing, preventable diseases, and positive health education for both children and adults, will present the latest and most authoritative findings and programs for the solution of these problems. Among the groups that will co-operate in the Congress are the following members of the National Health Council:—American Child Health Association; American Heart Association; American Public Health Association; American Red Cross; American Social Hygiene Association; American Society for the Control of Cancer; Conference of State and Provincial Health Authorities of North America; National Committee for Mental Hygiene; National Committee for the Prevention of Blindness; National Organization for Public Health Nursing; National Tuberculosis Association; United States Children's Bureau; United States Public Health Service; Women's Foundation for Health. In addition to these groups, it is anticipated that leading health associations of Canada, Mexico and elsewhere will co-operate in this Congress.

Already well organized plans are under way. The Atlantic City convention authorities and the hotels will co-operate to the fullest extent. The Steel Pier has been engaged for headquarters and meetings will be held there and at the nearby hotels on the boardwalk. Part of the space on the Steel Pier will be used for commercial and educational exhibits. A strict censorship will be exercised, however, in order that the exhibits may conform with the high standards of such a meeting.

The work on the Medical Centre of New York City which was initiated through the combined efforts of the Columbia University and the Presbyterian Hospital in the City of New York, is making steady progress. Two important additions have been recently added to the Centre. The Babies' Hospital and the Neurological Institute of New York have both signed agreements with the Joint Administrative Board and will receive land for the erection of their new institutions as a part of the Medical Centre.

The Babies' Hospital well known through the work of the late Dr. L. E. Holt is at present located at 55th Street and Lexington Avenue, and is unique in its field as it is the only institution which up to this time has devoted its efforts exclusively to children under four and a half years of age. In the new Centre the scope of the Babies' Hospital will be expanded to include older children. The Neurological Institute of New York which has just completed its fourteenth successful year, is equally unique in the medical field. It is the first co-operative effort of a neuro-psychopathic group in America to meet the growing need for treatment and study of the neurosis and early mental disorders among the working classes. The Joint Administrative Board has been augmented by the addition of the president of the Babies' Hospital, John Sherman Hoyt, and the president of the Neurological Institute, Robert Horne.

SCENTED decoys for the deadly tsetse fly are now employed in up-country districts by government entomologists. In order to trap and destroy the insects which cause sleeping sickness, dummy animals are being erected upon which the flies light with the intention of biting the animals. If animal odors cling around the dummies the flies will linger about until killed. Images of donkeys with brown paper legs are commonly employed.

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Book Reviews

Tumours of the Spinal Cord. By Charles A. Elsberg, M.D. 420 pages, 354 illustrations. Price $10.00 net. Paul B. Hoeber, Inc., 67 E. 59th, New York, 1925.

This attractive monograph is a record of the personal experiences of a neurological surgeon whose work has attracted attention during recent years. It is based on a study of one hundred cases of spinal cord tumour treated by the author by surgical methods over a period of twelve years. Chapters one and sixteen contain some interesting historical references. More than one-half of the book is devoted to case reports which are presented in a very pleasing manner. They are brief and concise and at the same time complete. All irrelevant data is wisely omitted. The numerous charts showing sensory disturbance and illustrations of gross and microscopic specimens elucidate the subject matter in an admirable manner. Other chapters take up the pathology, symptoms, diagnosis and treatment in detail.

While this work is of especial interest to neurologists and neurological surgeons it will be read with profit and pleasure by general practitioners. For the most part the methods used in diagnosis are available to all clinicians and it is made quite clear that a systematic examination of the nervous system along the usual lines will reveal the evidence which makes a diagnosis of spinal cord tumour possible. It is quite evident that great strides have been made in the surgical treatment of spinal cord tumours since 1889 when that great pioneer, Sir Victor Horsley, performed the first operation. The author's results which are summarized in his concluding chapter and which show a mortality of 10% are very gratifying. A comparison of these results with earlier figures and with the results of untreated cases should stimulate us all to look for these cases and direct them into the hands of the neurological surgeon at the earliest possible stage of the disease. The author strikes an apologetic note for the incompleteness of his bibliography but the three hundred references will no doubt satisfy most of his readers. The book is well bound, the print clear and distinct and the numerous illustrations leave nothing to be desired. In regard to the subject matter it bears testimony to work well done and it may be recommended as an authoritative work on the special subject with which it deals. K. A. MacKenzie

Leprosy. By Sir Leonard Rogers, C.I.E., M.D. and Ernest Muir, M.D. 301 pages, illustrated. Price $3.75 net. The Macmillan Co. of Canada, Ltd., Toronto, 1925.

Our knowledge regarding leprosy is still incomplete in certain details: for example, we do not yet know the mode of transmission. The literature, however, is voluminous, and it has been greatly in need of such a comprehensive and authoritative review as is now given us by Sir Leonard Rogers and Dr. Ernest Muir, for no such complete—and satisfying—survey of the various aspects of leprosy has appeared for nearly thirty years.

The history of the disease is presented with a masterly thoroughness, and provides, as carefully considered history should, guidance as well as warning; guidance as to the best methods of dealing with a disease still formidable amongst certain portions of the civilized nations, and a terrible scourge in large areas of Africa and far east; warning that measures must be strictly enforced and yet must not be allowed to defeat their own ends through a severity that is intolerable.

The advances in the specific treatment by means of chaulmoogra oil and its derivatives are clearly set forth. Chaulmoogra oil was a traditional remedy of undoubted value, but its nauseating and painful qualities constituted grave drawbacks. In Sir Leonard Rogers' hands these disadvantages have been largely overcome by improved methods of preparation and administration, and he has also discovered yet more valuable antileprous oils. How great an advance has been made by these methods of treatments can only be fully appreciated from the figures given, as well as from the excellent illustrations of cases under treatment. Even more important, perhaps, is the indirect effect of such success in raising hope in the minds of those suffering not only from the disease but from the despair of ever again being admitted to the joy of ordinary human intercourse.

H. E. MacDermot

The Technic of Local Anæsthesia. By Arthur E. Hertzler, A. M., Ph.D., LL.D., F.A.C.S. Third edition. 272 pages, 140 illustrations. Price $5.50 net. The C. V. Mosby Co., 508 N. Grand Blvd., St. Louis, 1925.

Many interesting points are brought out in the text. Two on page 100, however, are much below the standard and it is unfortunate that they are introduced among such good illustrations. The second paragraph in the preface contains an opinion which could easily have been expressed in more suitable language; however, this expression does not interfere with the scientific value of the book.

The subject of local anæsthesia is well covered. The method of employing it in the various lesions of the body is fully described and the illustrations are useful. There is a short chapter on sacral blocking, etc., also a short description of spinal anæsthesia; these deserve more attention than is given to them. In the paragraph on spinal anæsthesia no mention is made of French's work nor of Barker's in spinal anæsthesia. The volume as a whole, however, is valuable, not only to the beginner in the use of local anæsthesia but to those who have used it a good deal, as many important points are mentioned and illustrated. The reviewer can therefore recommend it to anyone thinking of purchasing it. G. R. Peterson

Recovery Record for Use in Tuberculosis. By Gerald B. Webb, M.D. and Charles T. Ryder, M.D. Second edition, revised. Pages 81 + chart sheets sufficient for two years. Price $2.00. Paul B. Hoeber, Inc., New York, 1925.

This is an admirable book for the patient suffering from tuberculosis. There are chapters upon "The Record of Recovery," "The Technique of Recovery," "The Hygiene of Recovery," and one upon "Accidents and Obstacles." The path of tuberculous patients towards cure is a difficult one for it is not easy for man or woman to withdraw from the work and play of the world. The patient requires a full measure of equanimity if, in the words of Trudeau, he is to "conquer fate by acquiescence." He will be greatly helped by a perusal of this book which is written for him without display of technical detail, but written with a sound sense of what the tuberculous patient should know about rest and such things. Some of the authors' phrases, such as, "be deliberately and rationally lazy," are excellent .

The charts are well suited to a daily record of the progress of the patient. Every page bears two quotations—which everyone should read—culled from the writings of authorities on this disease or from some of the world's greatest writers in verse or prose.

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The Surgical Clinics of North America. Vol. iv, No. 6. (Lahey Clinic Number). 166 pages, 43 illlustrations and complete index to Vol iv. Per clinic year February to December, 1924. Paper $12.00; cloth $16.00 net. Philadelphia and London, W. B. Saunders Co. The J. F. Hartz Co. Ltd., Toronto and Montreal.

This number, the last of the 1924 series, contains papers from the Lahey Clinic of Boston.

The major part of the volume is devoted to a symposium upon goitre. It presents the various viewpoints of the members of the clinic as they are correlated in the work of the hospital and has a distinct value as compared with papers from differing sources.

The feature most prominently presented in their operative work is the wisdom of making use of several stages even of six or seven; adding case reports in illustration. In addition to the surgical reports attention is given to medical and x-ray treatment but these are not considered of permanent value. The complications and associated conditions as seen in heart, larynx, eye and stomach as well as in a toxic state are well presented while, post-operative difficulties, and the question of the causation and treatment of tetany round out the symposium satisfactorily.

The volume is completed by papers on kidney cysts and on ureteral obstruction, by Howard M. Chute, illustrated by valuable radiographs; articles on biliary and duodenal fistulæ and devices to control them, by Dr. Lahey; and a contribution by Sara M. Jordan, on Functional Disease of the Colon, which emphasizes the need of differential exclusion of this condition in suspected appendicitis and cholecystitis.

This is the Index number and contains the contents of the previous parts as well. W. S. GALBRAITH

William Crawford Gorgas, His Life and Work. By Marie D. Gorgas and Burton J. Hendrick. Octavo, 359 pages, illustrated. Price $5.00. Lea and Febiger, Philadelphia and New York, 1925.

The subject of this excellent biography was born in a small town in Alabama in 1854, and was educated at the University of the South at Sewanee and later at the Bellevue Medical College in New York. In June, 1880, he entered the medical department of the United States Army. Up to 1898 he served at various army posts in Texas, North Dakota, and Florida.

His really important work began during the Spanish-American war when after the experimental researches upon yellow fever, during which the brave Jesse Lazear lost his life and Walter Reed showed that mosquitoes (*Stegomyia*) transmitted the disease, the sanitation of Havana was placed in his hands. "If it is the mosquito," said Gorgas, "I am going to get rid of the mosquito," and he succeeded in doing it. The world now knows what he achieved later in Panama which for centuries had been recognized as a "grave of white men and their hopes." It was a triumph for Gorgas and the result was obtained by efficient organization and steady purpose in spite of lack of support, we regret to say, on the part of the Isthmian Canal Commission. A chapter of the book describes his difficulties.

In all the annals of sanitation the work of Gorgas is unique. If we take the amount of malaria as an indication of sanitary efficiency we may see what Gorgas did. The death rate from that disease in 1906 was 8.49 per 1,000 population whilst in 1918 it had sunk to 0.11. "In 1914, the year the canal was opened, the general death rate of the United States was 14.1 per 1,000. The death rate of the canal zone in the same year was 6 per 1,000."

The book also tells of his work in connection with pneumonia in South Africa for the British Government and how he was made Surgeon-General, retaining this command throughout the European war. He died in London on July 3rd, 1920. It was realized by Great Britain that the Empire owed him a great debt for what he made possible in the tropical possessions which they could not repay, and he was given the funeral of a British Major-General in St. Paul's Cathedral. Those of us who were privileged to be present will never forget the solemnity and impressiveness of the occasion. ARCHIBALD MALLOCH

Infection, Immunity and Inflammation. By Fraser B. Gurd, B.A., M.D., C.M., F.A.C.S. 329 pages. Price $5.00. The C. V. Mosby Co., St. Louis, 1924.

This volume is written with the commendable object of stimulating more interest in the clinical observation of the various reactions of the tissues to irritants, be these irritants of the grosser bacterial nature which play a rôle in inflammation, or the smaller protein aggregates concerned in the various immunologic processes.

The matter is arranged under general headings: a chapter on infection and infectious agents, a series of chapters on immunity and immunization, and a consideration of the physiology of anaphylaxis, desensitization and tolerance. Next there is a development of the subject of the various forms of immunity and the bodies concerned in each, and finally an excellent presentation of the clinical application of these factors to man and their use in the treatment of disease.

These latter chapters will be of particular interest to the clinician, presenting as they do the considerations of one who has studied the processes concerned from the point of view of the practising surgeon rather than from the abstract position of the purely laboratory worker. The volume shows the modern trend towards the explanation on a chemical and physical basis of the processes described and is a distinct credit, not only to the author's critical judgment but also to his industry and zeal. While the author maintains a commendable avoidance of new terms, still we note the appearance of two or three recruits to the already formidable ranks of immunologic terminology. The printing is excellent and there is a carefully compiled index. D. SCLATER LEWIS

Essentials of Infant Feeding. By E. A. Barton, M.D. 80 pages. Price 3s 6d. H. K. Lewis & Co. Ltd., 28 Gower Place, London, 1925.

In a very brief and concise manner the author has outlined for the benefit of students the fundamental facts which form the basis of infant feeding. The part of the book dealing with breast feeding is well handled and instructive although the author's views regarding complemental and supplemental feedings are open to criticism. The chapter dealing with the various milks used in infant feeding describes the percentage composition of human and cow's milk and the method of preparation of peptonized, powdered, citrated and condensed milk but does not refer to the preparations commonly in use on this continent such as protein milk and lactic-acid milk. In the chapter on artificial feeding sound advice is given as to the preparation of the feeding, and the care of the bottles, nipples, etc. The advantages of the percentage and caloric methods of feeding are discussed and special attention is given to the care of the premature infant and the feeble infant. There is, however, no classification of types of feeding cases; marasmus and fermentative diarrhœa being considered under the broad heading, the feeble infant. American pædiatricians will note with surprise that the author advises the use of Nestle's food, malted milk and Mellin's food; that the four-hour interval of feeding is condemned until after the sixth month and that he considers the

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protein element in the diet the most dangerous and the carbohydrate the least so. E. A. MORGAN

Lectures in Pathology. Edited by Ludwig Aschoff, M.D. 350 pages. Price $5.00. Paul B. Hoeber Inc., New York, 1924.

In the spring of 1924, Aschoff, long known as one of the leading German contemporary pathologists, was invited to visit the United States to deliver a series of lectures. At that time he gave the January lecture and a Harvey lecture in New York; the Lane lectures in San Francisco; the Osler lecture in Los Angeles as well as one or two others. These various lectures have been collected and published in the present volume

The subjects dealt with are:—the reticulo-endothelial system; the pathogenesis of human pulmonary tuberculosis; concept of inflammation; pathological fatty changes; the normal and pathological morphology of the superarenals; atherosclerosis; ovulation and menstruation; the orthology and pathology of the extra-hepatic bile passages; the origin of gall-stones; the site of formation of bile pigment; thrombosis; the relation of mucosal erosions to the development of ulcer of the stomach; the goitre problem, especially the goitre of puberty; a morphological study; renal secretions and renal diseases. Each of these topics is considered in a very interesting and stimulating fashion. Many of these are subjects to which Aschoff and his collaborators or pupils, have devoted considerable attention. One is much impressed with the scholarly review of the many facts which are here marshalled in logical order and dealt with in a succinct, concise and usually, satisfactory manner. At times it seemed to the reviewer that pre-war contributions to these subjects and the views of a similar period more or less dominated the picture presented. Perhaps they are entitled to do so. In any event a detailed review of the extensive subject matter of the book cannot be given here. It is sufficient to emphasize that all those who are not already familiar with the contents of this little book will be advised to become so. J. G. FITZGERALD

Principles of Surgery for Nurses. By M. S. Woolf, M.A., B.Sc., M.R.C.S., L.R.C.P. 12mo. of 350 pages, illustrated. Price $3.00 net. W. B. Saunders Co., Philadelphia and London: The J. F. Hartz Co. Ltd., Toronto and Montreal, 1925.

The author says in his preface that the book is the result of the "endeavour of a teacher to meet the demands of nurses for a simple statement and explanation of surgical conditions. He has come reasonably close to his ideal. A good text book should (1) bristle with essentials; and (2) its form should clothe them in easy graceful composition. Dr. Woolf has succeeded in both.

In the twenty-four chapters of the book, he covers the surgical field fully enough for all purposes of the nursing profession, anatomy, physiology, pathology and surgery are linked together in clean cut, logical writing which puts no unnecessary strain upon the students' powers. The introduction is happily conceived and written; so the pupil nurse entering upon her surgical studies may feel the joys of companionship with the truly great. Cuts of Lister and John Hunter adorn this part of the book. The phenomena of inflammation are clearly explained and linked up with the various infections and their treatment, so that principles and practice harmonize readily and logically. The agreeable plan is followed of giving the names of the great pioneers from whose discoveries the management and treatment of the conditions in question have been evolved.

A careful reading of the different chapters leaves one with small scope for adverse criticism. Perhaps the chapter "Treatment of Fracture" might be improved by a little more emphasis on first aid management of compound fractures. The summary at the end of each chapter enhances the teaching value of a very excellent text book. GEORGE H. MURPHY

Surgical Pathology. By William Boyd, M.D., M.R.C.P., Ed., F.R.C.S., Professor of Pathology, University of Manitoba; Pathologist to the Winnipeg General Hospital, Winnipeg, Canada. Pp. 837, 340 illus. and 13 coloured plates. Philadelphia and London: W. B. Saunders Company, 1925.

This book is a welcome addition to the literature on a subject that has hitherto been very inadequately represented in the English-speaking world, and that has not, so far as we know, been so comprehensively treated in any other language. It presents to the reader far more than a mere descriptive compendium of tissue changes for use in the diagnosis of pathological material. In it we recognize, in the words of the Foreword, by Dr. William J. Mayo, the author's "sincere attempt to place pathology itself before the student and the practitioner from the practical standpoint," and to supply in it at once a handbook for the use of the surgeon and the internist, and a guide to the beginner in the field of medicine. His reasons for this broad treatment of the subject are clearly given by him in the opening chapter of the book, entitled "Surgery and Pathology," in which he traces the birth of modern scientific surgery from the great physiologist-anatomist-pathologist-surgeon, John Hunter, and points out that a working knowledge of the principles of pathology and a familiarity with the gross and microscopic appearances of the tissues in disease, is a fundamental part of the training of the modern surgeon, and an essential pre-requisite for the possession of sound surgical judgment, which "is based on a comprehension of pathological conditions." The surgeon, he says, should "develop a radiographic vision, which will pierce through the skin, the deep fascia, the muscles, down to the bones themselves, nay, even to the very bone cells, which he can watch in his imagination as they marshall their forces, invade the callus, and commence to lay down new bone." The fundamentals of such knowledge are to be gained, he points out, in the first place in the post mortem room, where the disease process can be seen as a whole in the final stages of its development, and in the light of the clinical picture; and, in the second place, through the correlation with this of a knowledge of "the pathology of the living," where the initial lesion can best be seen, and which can only be gained in full measure through material obtained at the operating table. Only by the combination of the facts and statistics acquired from these two sources can a true "Surgical Pathology" be built up, and to the surgeon so trained we may look in the future for a more intimate knowledge of the incipient and preventable stages of many lethal diseases.

The book is in two parts, which deal with General and Special Pathology. The first, on general pathology, comprises twelve chapters on the subjects of special surgical interest, such as bacteriology, inflammation, healing and repair, the infections, tuberculosis, syphilis and other infectious granulomata, gangrene, surgical shock, tumours, etc. The chapter on "Surgical Bacteriology" is written, as the preface states, for the surgeon and not for the bacteriologist, and contains for the former, much useful information. A section of great practical value in it is that "On the Collection of Material"; pus, blood for Wassermann, blood culture, blood-chemistry and transfusion, cerebro-spinal fluid, serum from chancre, autopsy and biopsy material, etc. The theoretical subjects of this first part are treated with much simplicity and clearness, and views accepted at the present time are usually put forward, without undue discussion of confused

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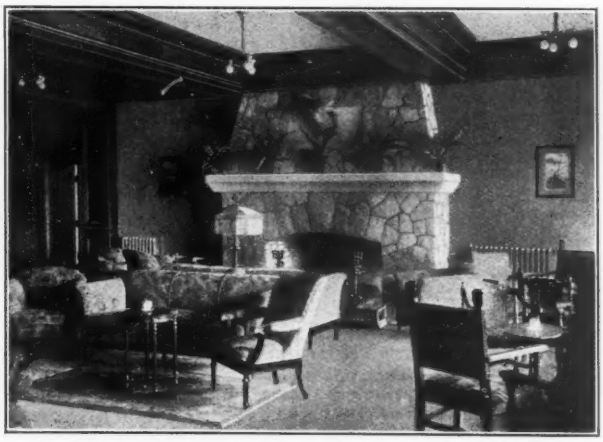

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issues. Thus inflammation is defined and described as "the reaction to injury," healing and repair as independent processes, and the classification of tumours adopted is the simple histological one followed by Ewing. The section on Surgical Shock, which process is described as a capillary paralysis and hyperpermeability with associated degenerative changes in the higher nerve centres of as yet unexplained origin, is interesting and suggestive. Under the etiology of tumours, an important discussion of the possible parasitic origin of cancer is given, which view the author appears to support.

The second section of the book, which is devoted to special pathology, comprises twenty-five chapters, and under it the special systems and the individual organs and their diseases are discussed. The pathology of the nervous system is considered under the headings of "The Cranial Contents," "The Pituitary Body," and "Spine and Spinal Cord," and here the fruits of the author's personal researches are abundantly evident. Except for a section on empyema the subject of diseases of the respiratory system, is conspicuous by its absence, which omission may possibly be explained by the fact that this is not a field which offers much to the general surgeon. All the other systems and tissues of the body come in for full consideration, that on diseases of the female genitalia, so often omitted in treatises on surgical pathology, being especially full and valuable. Other contributions of great value to the surgeon are those on pancreatic necrosis, in which the valuable contributions of Archibald receive full acknowledgment; on the gall bladder and on chronic mastitis.

The subject matter is treated systematically throughout, and the book is written in a clear and forceful style, with an ease of diction, wealth of illustration, and philosophical and historical flavour that betray the author's cultural background. The influence of his experience in the Great War is also clearly visible between the lines.

Its content is based, as the preface states, on personal observation of cases in the Winnipeg General Hospital and of specimens in the Pathological Museum of the University of Manitoba, reviewed in the light of the best modern literature, and of a good working knowledge of the views of the best modern authorities. The majority of the illustrations are drawn from the author's own laboratory and museum material, but here the systematic treatment of the subject has led to the introduction of a number of well selected plates and figures drawn also from other sources, which, while they may detract somewhat from the impression of originality which the work otherwise conveys, undoubtedly assist in the lucidity of its presentment. Each section is followed by a selected list of important and accessible references for the use of the student, and a good index is supplied.

Altogether the book presents a well ordered and authenticated mass of information, which is amplified in parts by the personal researches of the writer, and which is in all parts easy of access to those who seek information on any given point. The book-making is good, the type pleasing, the illustrations attractive and demonstrate what they intend to show, and the coloured plates, that embellish it, are exceptionally fine. Its appearance may truly be considered an event in Canadian medicine, for in it is supplied, from one of our northern universities, a leading text-book of surgical pathology that is sure of its welcome from the professional and student body at large, and that is bound to be of value also to the practical pathologist wherever it comes into his hands.

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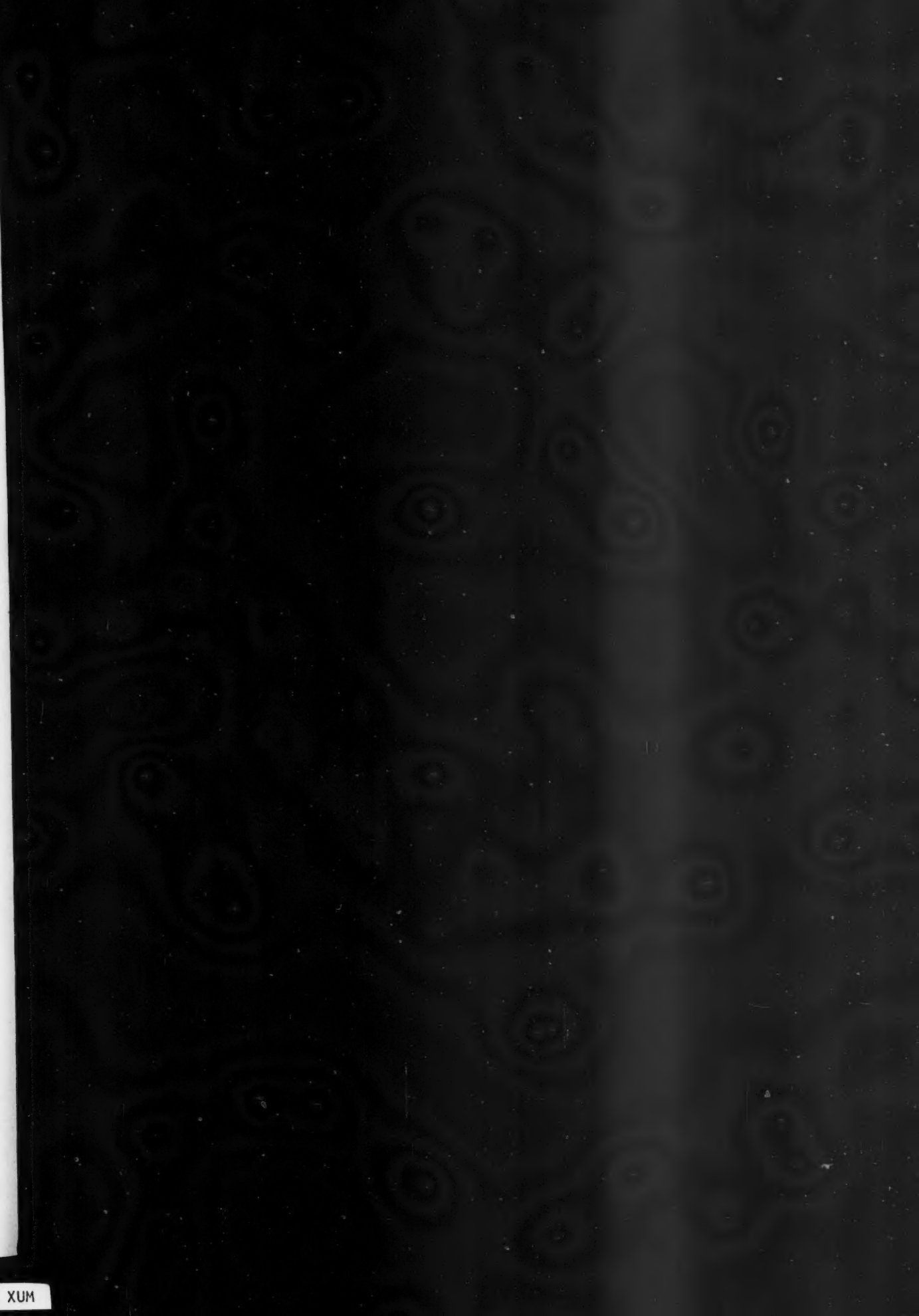
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